

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXI: No. 7.

New York, Thursday, February 15, 1883.

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

## The Iron Movement at Cincinnati.

The following interesting facts and statistics regarding the iron trade are taken from the advance sheets of Superintendent Maxwell's report to the Cincinnati Chamber of Commerce:

The year to the general iron interests of Cincinnati has been a very satisfactory one. It has been a period of great activity, equable conditions and generally favorable circumstances, and one that was singularly free from speculative influences. It has been a season in which actually legitimate demand came as near regulating prices as has been seen in many years. Specially has it been an encouraging one to this city, whose manufacturers have been actively and profitably employed, and whose relation to the actual production of iron never was so marked in its importance. In the preceding report, reference was made to the closer relations we were enjoying with the great iron region of the South, on account of the completion of the Cincinnati Southern Railroad, the practical extension of the Louisville and Nashville Railroad to Cincinnati, and the completion for through rail business of the Chesapeake and Ohio Railroad. These results, though not actually occurring at the same time, were practically simultaneous, and mark a new era in the iron history of this city. The immediate benefits, to which allusion was made last year, have become the more pronounced in the year just closed, and the prospective advantages these new agencies are to furnish have found clearer revelation. They, too, are to have very important reinforcement by the completion of the road to Knoxville and the building of a direct connection with Nashville, which seems probable in the near future. All these have the larger significance as the mineral riches of the South become better known, for it is well understood that the more that is learned concerning the mines of wealth in the mineral regions pierced by these great lines of railroad, the more valuable they become and the larger importance Cincinnati assumes as the natural point for the distribution and consumption of their products. The total quantity of pig iron manufactured in the United States in the calendar year of 1881 was 4,641,564 net (2000 pounds) tons, in comparison with 4,295,411 tons in the preceding year, and 3,073,875 tons in 1879. Now, of the whole quantity made in 1881 in the country, the aggregate output of the States of Alabama, Georgia, Indiana, Kentucky, Michigan, Missouri, Ohio, Tennessee and West Virginia contributed 1,349,961 tons, in comparison with 1,250,116 tons in 1880, and 876,445 in 1879. It thus appears that the district tributary to this city in the year 1881 showed an increase over the preceding year of 99,845 net tons, or about 8 per cent., and that it produced over 29 per cent. of the entire product of the United States, and this notwithstanding Indiana, Kentucky and West Virginia showed 20,864 tons less made than in 1880. As showing what the South is doing, it may be remarked that of the whole increase in these nine States, Alabama, Tennessee and Georgia furnished 47,507 tons, or very nearly one-half of the whole increase in the district tributary to Cincinnati, the output of the three States having been, in 1881, 222,891 tons, compared with 175,384 tons in 1880.

The business transacted in pig iron at Cincinnati shows an encouraging increase over the previous year, and consequently over any preceding year, inasmuch as the sales of 1880-81 were, to that time, much the largest on record. It having been a year free from speculation of every kind, whatever increase may be apparent is one based on the fairly legitimate business of the city. According to confidential information furnished the superintendent of the Merchants' Exchange, the actual sales of pig iron from first hands, for consumption, during the commercial year ending August 31, 1882, aggregated 386,510 tons, compared with 334,702 tons in 1880-81, 248,519 tons in 1879-80, 212,218 tons in 1878-79, 125,012 in 1877-78, 129,194 in 1876-77, and 137,646 in 1875-76. These figures also embrace iron sold to go directly from the furnaces to the places of consumption, whether the same touched this city or not, which accounts for the difference between this aggregate and the actual movement, which was much less, the total receipts of pig iron in the past year having been 156,340 tons, in comparison with 137,161 tons in 1880-81. The actual shipments aggregated 100,983 tons, in comparison with 97,665 tons in 1880-81.

It will thus be seen that the past year, viewed from any standpoint, is the largest that this city has ever transacted. The figures, which show the successive stages of our progress in this great department of business, are more expressive than anything else that could be presented. They show a business which has grown in a few years from comparatively small proportions to great influence and extent, and one that is making itself felt in the whole realm of the iron business of this country. Nor is there any reason why the increase should not be as large in the future as in the past. Possessing the largest assortment of iron of any market in the country, and the natural point for the distribution of the resources of a region wonderfully rich in iron, there appears every reason to expect continued development, both in the extent and influence of this important branch of

our business. Prices during the year have been free from any considerable fluctuations, and to the manufacturers of and dealers in manufactured iron the year has been

Spain's Iron Ore Trade.—Within recent years the iron-ore trade of Spain has been developed with remarkable rapidity. In four years, as the figures will show, the

in 1882, 3,737,347 tons. The greatest maritime movement in the history of Bilbao was on May 3, 1882, when 62 steamers and 7 sailing vessels cleared from the port, and on

## Recent Improvements in Cranes.

The Yale Lock Manufacturing Company, of Stamford, Conn., have recently made improvements in the construction of traveling, jib, pillar and other cranes, operated by either hand or power, which have attracted a great deal of attention, and a description of these improvements will therefore undoubtedly prove of interest to our readers. The salient features of these cranes, which will be found further on described in detail, consist in the adaptation of the T. A. Weston patent system of propulsion, combined with the T. W. Capen patent crab, reversing and other mechanisms for the purposes specified, resulting in the production of cranes possessing marked advantages. We shall describe the different kinds of cranes made by the Yale Lock Manufacturing Company, by selecting from those at present in use such as are typical of their class, the general principles of construction being the same for each type, though of course they vary in dimensions of parts and details.

The first type of crane to which we desire to call the attention of our readers is very well represented by the heavy 25-ton traveling crane, a general view of which is shown in Fig. 2. The machine consists of a bridge moving on longitudinal tracks, and a trolley moving on the bridge. At one end of the bridge is a crab containing the operating mechanism, and suspended beneath this is the operating platform. Power is communicated to the crane by an endless wire rope which moves continually in one direction. The mechanism is such that the operator standing upon the suspended platform is enabled, by means of three levers, to apply the power so as to cause the bridge to travel longitudinally on the tracks, or the trolley to travel in either direction across the bridge, or to raise or lower the load. The bridge and trolley may be moved independently or simultaneously, as may be required. Fig. 4 is a perspective diagrammatic or outline view of an entire traveling crane, indicating the moving cable for transmitting power, by the heavy line on the right, which passes around the driven wheel F, the two fixed cables D and D' for propelling the bridge, and the endless chain passing from the crab to the trolley, &c. The parallel longitudinal main tracks upon which the bridge travels back and forth are indicated by A; the bridge resting upon these tracks, by B; the trolley, adapted to travel to and fro upon the bridge, by C; the crab is represented by E, and the fixed cables, engaging by means of sheaves with the bridge and crab, by D D'. These fixed cables are provided with suitable guide-sheaves above the crab, whereby the cables are deflected downward into engagement with their grip-wheels outside the crab-frame. The crab mechanism E does not travel with the trolley, but is fixed beneath one end of the bridge, and adapted to be driven by power to operate the bridge in connection with the fixed cables, to traverse the trolley and to do the hoisting and lowering by means of chains and suitable shipping levers under the control of the operator.

The bridge for the 25-ton overhead traveling crane under consideration consists of two wrought-iron riveted plate girders, 60 feet long over all. These girders are 4 feet 6 inches deep at the center, and 2 feet 6 inches at the ends. The flanges are formed of two 6 x 6 x 3/4 inch angles for the top and of two 6 x 4 x 3/4 inch angles for the bottom flange. The web is formed of 1/2-inch wrought-iron plate with suitable stiffeners. The girders are so dimensioned that under the maximum load—load suspended at center—the outside fiber strains do not exceed one-sixth of the ultimate strength of the iron. The fixed cables D D' extend each from one end of one of the longitudinal tracks to the opposite end of the other track, crossing the space between the tracks upon the bridge which carries the crab mechanism and trolley, and serve, one with the other, to impart the horizontal movements to the bridge, which mode of propulsion is covered by the T. A. Weston patent. These fixed wire cables, after passing around proper guide-sheaves at each end of the bridge, engage with grip-wheels on the crab. These grip-wheels can be rotated by power in either direction, the effect of which is to steadily pull the bridge along in either direction desired. Under this system the absolute parallelism of the end trucks of the bridge with their tracks is assured, so that the bridge moves always smoothly and with the least possible friction. In the 25-ton crane under consideration the truck wheels are 36 inches in diameter, with chilled tread, double flanged. Their axles are of iron, 4 1/4 inches in diameter, running in spherical bronze boxes. The driving-rope employed is a 5/8-inch cotton rope, running at a speed of 5000 feet per minute. The driving and driven wheels are 4 feet in diameter, with polished grooves, arranged with idlers 3 feet in diameter, so that the rope has a contact of 180°. The shaft that carries the first driver on the bridge is 2 1/4 inches in diameter, making 400 revolutions per minute. The trolley-wheels are 15 inches in diameter on tread.

In order to effect the several operations of the crane it is necessary that the mechanism should be capable of hauling in or paying out either one of two separate chains or ropes independently of the other, and also capable of paying out both of the ropes simultaneously, or of hauling them in simultaneously; also that it should be capable of paying out the one and hauling in the other

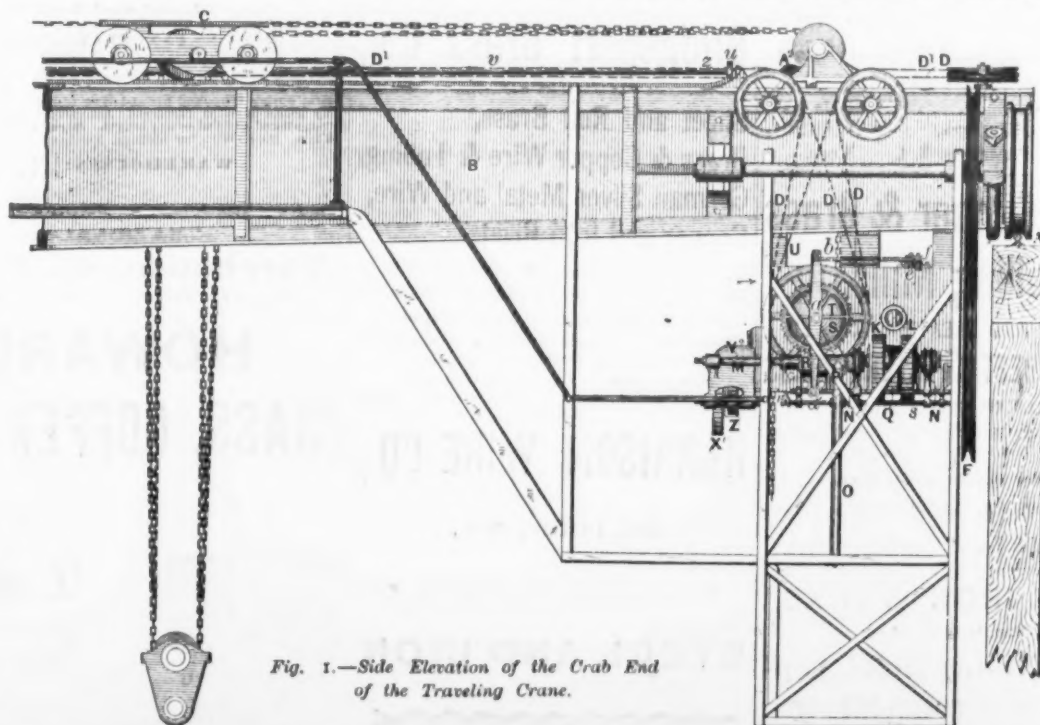


Fig. 1.—Side Elevation of the Crab End of the Traveling Crane.

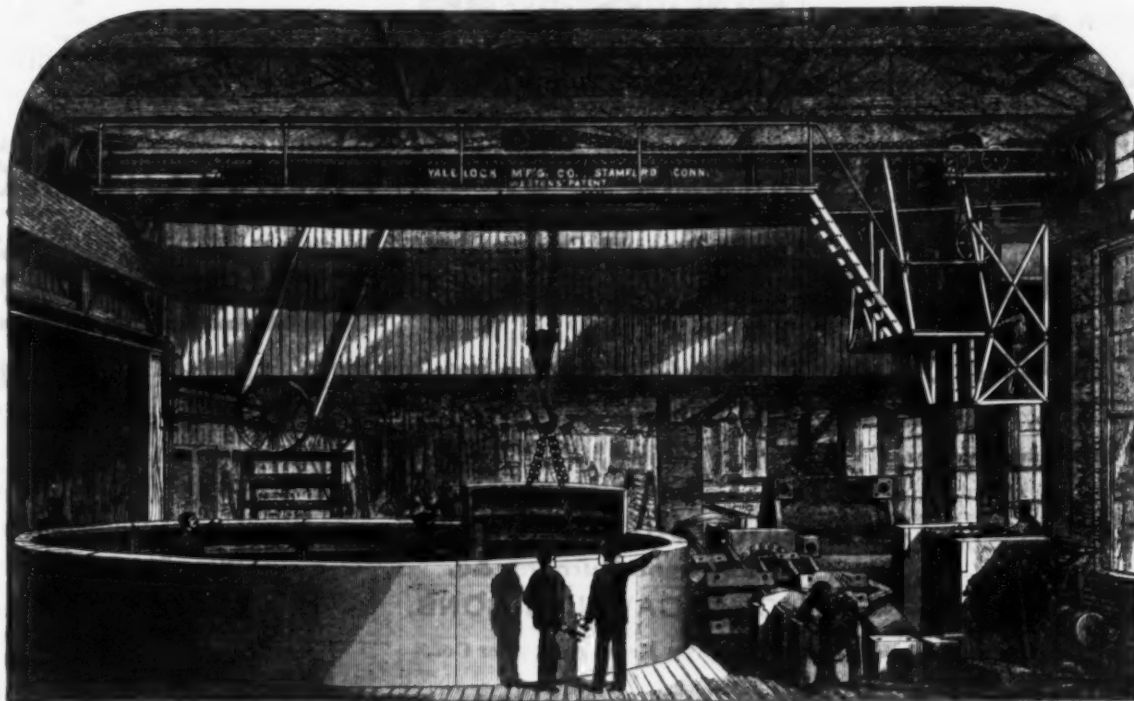


Fig. 2.—General View of Weston's Patent Power Traveling Crane.

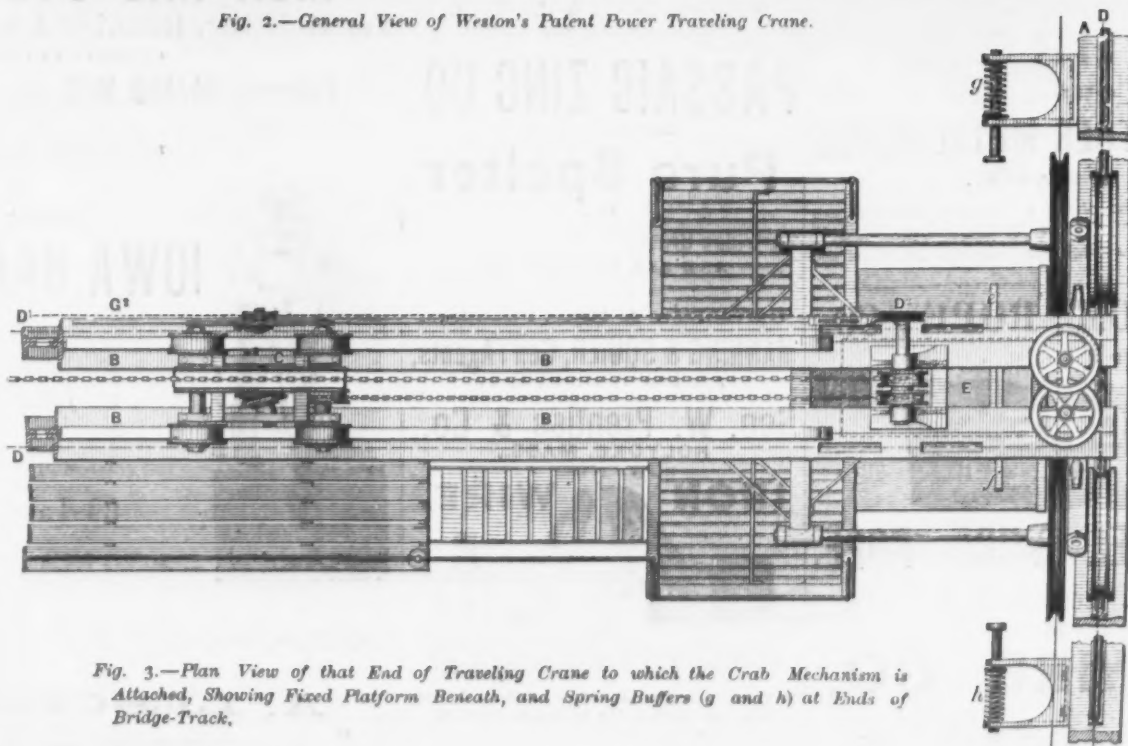


Fig. 3.—Plan View of that End of Traveling Crane to which the Crab Mechanism is Attached, Showing Fixed Platform Beneath, and Spring Buffers (g and h) at Ends of Bridge-Track.

## RECENT IMPROVEMENTS IN CRANES.

airly remunerative and mainly satisfactory, although doubtless largely made so by the strike which commenced in the Pittsburgh and Wheeling districts on the 1st of June and continued until October 1.

shipments of ore from Bilbao have trebled. The total quantity of iron ore shipped from this port during the year 1875 was 1,255,255 tons; in 1879, 1,160,248 tons; in 1880, 2,390,732 tons; in 1881, 2,550,549 tons, and

the 10th of March, when 36 steamers and sailing vessels entered the river. The total number of ships which entered the port in 1882 was 5244, having a registered tonnage of 2,285,684 tons.



# ANSONIA BRASS & COPPER CO.,

No. 19 CHURCH STREET,  
Phelps Building, NEW YORK,  
MANUFACTURERS OF

## BRASS AND COPPER

IN  
Sheets, Bolts, Rods, Wire, &c.  
Seamless Brass & Copper  
Tubing.

Ansonia Corrugated Stove Platforms.  
PURE COPPER WIRE  
Electrical Purposes, Bare and Covered.  
Phosphor Bronze Rods for Pumps, &c.

ANSONIA ★ REFINED  
INCOT COPPER.

# PHELPS, DODGE & CO.,

IMPORTERS OF

## TIN PLATE,

ROOFING PLATE,

Sheet Iron Copper, Pig Tin, Wire,  
Zinc, &c.

MANUFACTURERS OF—

## COPPER AND BRASS.

CLIFF STREET, NEW YORK.

# SCOVILL MFG CO

BRASS,  
HINGES WIRE, GERMAN SILVER.

PHOTOGRAPHIC GOODS.

## BUTTONS,

CLOTH AND METAL.

DEPOTS, FACTORIES

419 & 421 Broome St., N. Y. Waterbury, Conn.  
177 Devonshire St., Boston. New Haven, Conn.  
183 Lake St., Chicago. New York City.

# DICKERSON, VAN DUSEN & CO.,

Importers of

Tin Plate, Pig Tin, Sheet Iron, Copper,  
Wire, Zinc, Etc.,  
29 & 31 CHURCH ST., cor. Fulton,  
DICKERSON & CO., Liverpool. NEW YORK.

# THE NEW HAVEN COPPER CO.,

SOLE MAKERS OF

## POLISHED COPPER

Under Patent of T. James, Sept. 10, 1876.

ALSO MANUFACTURERS AND

DEALERS IN

## BRAZIERS & SHEATHING COPPER,

Kettles, Bottoms, Bolts, Circles, &c.

290 Pearl Street, - NEW YORK.

# A. C. NORTHROP,

Waterbury, Conn.,

NOVELTIES IN BRASS AND OTHER METAL GOODS  
FOR HARDWARE TRADE.

Wrought Iron and Brass Machine Screws; Turned, Hexagon, Round and Square Head Cap and Set Screws; Brass and Iron Safety and Jack Chain; Gilt, Nickel Plated and Bronze Trimmings of all kinds from Sheet Iron, Steel or Brass.  
Estimates on patented articles, or any description of Sheet Metal work, respectfully solicited and promptly given.

# BRODERICK & BASCOM ROPE CO.,

MANUFACTURERS OF



IRON WIRE ROPE. STEEL WIRE ROPE.  
728 N. Main St., St. Louis, Mo.

# WORCESTER WIRE CO.,

Manufacturers of

## IRON AND STEEL WIRE

For all Purposes.  
WORCESTER, MASS.



# Waterbury Brass Co.

CAPITAL, - \$400,000.

Sheet, Roll and Platers' Brass,  
GERMAN SILVER.

Copper, Brass and German Silver Wire,  
BRASS AND COPPER TUBING.

COPPER RIVETS & BURS,  
BRASS KETTLES.

Door Rail, Brass Tags,  
PERCUSSION CAPS,

POWDER FLASKS.

Metallic Eyelets, Shot Pouches, Tape Measures, &c.  
And small Brass Wares of every Description.  
Cartridge Metal in Sheets or Shells a Specialty.  
Sole Agents for the

Capewell Mfg. Co.'s Line of Sport-  
ing Goods.

DEPOTS: 296 Broadway, New York, WATERBURY,  
125 Eddy St., Providence, R. I. Conn.

# Detroit Copper & Brass

## Rolling Mills.

BRAZIERS' AND SHEATHING COPPER,  
ROLLED, SHEET & PLATERS' BRASS

GERMAN OR NICKEL SILVER,  
Copper Wire for Electrical and other purposes,  
Brass and German Silver Wire,  
Copper Rivets and Burs,  
COPPER BOTTOMS FOR TEA KETTLES AND BOILERS,  
Cor. Larned & Fourth Sts., Detroit, Mich.

# ROME IRON WORKS,

Manufacturers of

Brass, Gilding Metal, Cop-  
per and German Silver  
(In Sheets, Rods, Tubing or Wire),  
COPPER & BRASS RIVETS  
AND BURS.

Rome, New York.

# BROWN & BROTHERS,

81 Chambers St., N. Y. Waterbury, Conn.

MANUFACTURERS OF

# BRASS, COPPER AND GERMAN SILVER

In Sheets, Rolls, Rods, Wire, Tubing,  
Rivets, and Burs, Etc.

ALSO,

Seamless Brass & Copper Tubing.

PATENTED SEAMLESS BRASS AND COPPER  
HOUSE BOILERS, warranted to stand 200 lbs  
pressure and guaranteed against vacuum.

PATENTED SPRING TEMPERED SHANK,  
SILVER-PLATED, FLAT TABLE WARE, in rich  
designs.

GERMAN SILVER SPOONS AND FORKS.

# The Plume & Atwood Mfg. Company,

MANUFACTURERS OF

## SHEET and ROLL BRASS and WIRE,

German Silver and Gilding Metal,

Copper Rivets and Burs,

Copper Electrical Wire, Pins,

Brass Butt Hinges,

Jack Chain,

Kerosene Burners,

Lamp Trimmings, &c.

18 Murray Street, New York.  
13 Federal Street, Boston.  
109 Lake Street, Chicago.

Rolling Mill, Factories,  
THOMASTON, CT. WATERBURY, CT.

# Bridgeport Brass Co.,

MANUFACTURERS OF

Sheet and Roll Brass,

Brass & Copper Wire & Tubing,

German Silver Metal and Wire,

Copper and Iron Rivets.

OILERS and CUSPADORES, LAMPS and TRIMMINGS,  
LANTERNS and TRIMMINGS, KEROSENE BURNERS,  
Clocks & Fly Fan Movements, PLUMBERS' MATERIALS.  
Particular attention paid to cutting out Blanks and  
manufacturing Metal Goods.

MANUFACTORY, WAREHOUSE,  
Bridgeport, Conn. 19 Murray St., N. Y.

# HARRISON WIRE CO.,

ST. LOUIS, MO.,

MANUFACTURERS OF ALL KINDS OF

## STEEL AND IRON

## WIRE ROPE

Wire Cloth, partly  
unrolled.

HEAVY ROLLED CLOTH FOR MALT KILN FLOORS.

Wire Work, Wire Fence, Railing and Guards.

ABRAM S. HEWITT, President  
WM. HEWITT, Vice President.

THE  
TRENTON IRON COMPANY,

(INCORPORATED 1877),  
TRENTON, N. J., Manufacturers of

## IRON and STEEL WIRE

OF ALL GRADES,

BRIGHT, ANNEALED, COPPERED, TINNED AND GALVANIZED

Iron and Steel Wire Rods;

EXTRA QUALITIES OF BAR IRON AND RODS.

Best Qualities of Gun-Screw and Charcoal Iron Wire;

Crucible, Siemens-Martin and Bessemer Steel Wire.

Wire Straightened and Cut to Lengths.

New York Office, COOPER, HEWITT & CO., 27 Bowling Slip.  
Philadelphia Office, JOHN HEWITT, Agent, 21 North Fourth St.

IRON AND STEEL WIRE ROPE

For Hoisting, Running & Standing Ropes, Ferries, &c.

CONSTANTLY KEPT ON HAND.

Address: HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

This Advertisement Changed Weekly.

IOWA BARB WIRE CO.,

99 John St., NEW YORK.

89 Lake St., CHICAGO.

STAUFFER, MACREADY & CO., New Orleans, La. CARLIN & FULTON, Baltimore, Md.

A. LESCHEN & SON,

Manufacturers of

## WIRE ROPE

OF EVERY DESCRIPTION.

110 to 122 N. Main St., ST. LOUIS, MO.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

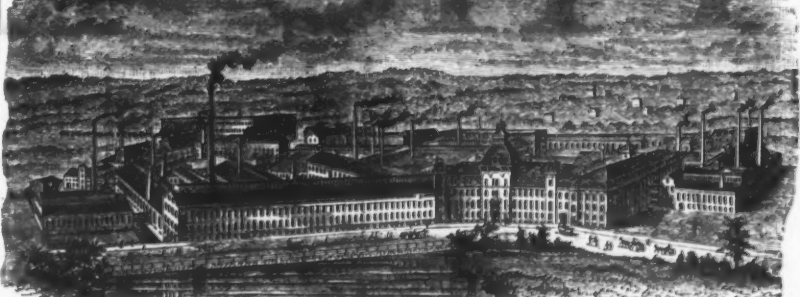
Correspondence invited.

Correspondence invited.

Correspondence invited.

# WASHBURN & MOEN MANUFACTURING CO.

Established 1831. WORCESTER, MASS.



## IRON and STEEL WIRE,

Patent Steel Barb Fencing, Patent Steel Wire Bale Ties.

WIRE RODS of all grades: Round Iron, Rivet quality, 1/4 in. to 1/2 in., cut to any length. Owners and exclu-  
sive Operators of the PATENT CONTINUOUS ROLLING MILL, producing Iron and Steel WIRE in  
coils of 100 pounds, without seam or weld. Patent Galvanized Telegraph Wire, Market and Stone Wire,  
Annealed Fence and Grape Wire in long lengths: Coppered Rail-Rail Wire, Rope, Bridge, Bolt, Screw, Rivet, Buckle  
and Chain Wire. Wire for the manufacture of Card Clothing, Heddles, Reeds, &c. Piano-string Covering Wire,  
Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and  
Spiral Spring Wire, and Refined Wire to Pattern for particular purposes, from selected stamps of Norway Iron.  
Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished,  
Straightened and Cut to any length. Steel Crinoline Wire, Patent Linen finish. Unriveted Steel Music  
Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

WAREHOUSES: New York, 16 CHURCH, and 241 Pearl Sts.  
Chicago, 107 and 109 Lake St.

'NATIONAL WIRE AND LANTERN WORKS,'

Warehouse, 45 Fulton Street, New York.

And California Wire Works Co., San Francisco, Cal.

Manufactory, Nos. 1197, 1199, 1201, 1203, 1205, 1207, 1209 and 1211 De Kalb Avenue, Brooklyn, N. Y.

# HOWARD & MORSE,

MANUFACTURERS OF

## BRASS, COPPER & IRON WIRE CLOTH,

Exclusive Manufacturers of the

Wire Cloth, partly  
unrolled.

HEAVY ROLLED CLOTH FOR MALT KILN FLOORS.

Wire Work, Wire Fence, Railing and Guards.

ABRAM S. HEWITT, President  
WM. HEWITT, Vice President.

JAMES HALL, Treasurer.  
E. HANSON, Secretary.

# THE TRENTON IRON COMPANY,

(INCORPORATED 1877),  
TRENTON, N. J., Manufacturers of

## IRON and STEEL WIRE

OF ALL GRADES,

BRIGHT, ANNEALED, COPPERED, TINNED AND GALVANIZED

Iron and Steel Wire Rods;

EXTRA QUALITIES OF BAR IRON AND RODS.

Best Qualities of Gun-Screw and Charcoal Iron Wire;

Crucible, Siemens-Martin and Bessemer Steel Wire.

Wire Straightened and Cut to Lengths.

New York Office, COOPER, HEWITT & CO., 27 Bowling Slip.  
Philadelphia Office, JOHN HEWITT, Agent, 21 North Fourth St.

IRON AND STEEL WIRE ROPE

For Hoisting, Running & Standing Ropes, Ferries, &c.

CONSTANTLY KEPT ON HAND.

Address: HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

This Advertisement Changed Weekly.

IOWA BARB WIRE CO.,

99 John St., NEW YORK.

89 Lake St., CHICAGO.

STAUFFER, MACREADY & CO., New Orleans, La. CARLIN & FULTON, Baltimore, Md.

A. LESCHEN & SON,

Manufacturers of

## WIRE ROPE

OF EVERY DESCRIPTION.

110 to 122 N. Main St., ST. LOUIS, MO.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.

Correspondence invited.





**O. LINDEMANN & CO.**  
Manufacturers of all kinds of  
Japanned, Brass &  
Tin Plated  
**BIRD CAGES.**  
Catalogues furnished to the trade.  
254 Pearl St.,  
NEW YORK.

**CARY & MOEN,**  
Manufacturers of  
**STEEL WIRE** for all purposes and **STEEL SPRINGS** of every description.

Market Steel Wire, Crinoline Wire, tempered and covered.  
Also Patent Tempered Steel Furniture Springs, constantly on hand.  
884, 886 and 888 West 99th Street, NEW YORK.

**POWER PRESSES,  
RIVET MACHINES,  
Special Machinery to Order.**

**IRON and BRASS RIVETS,  
STUDS, PINS, &c.,  
For Manufacturers of Light Hardware.**

**BLAKE & JOHNSON,  
WATERBURY, CONN.**

**POPE, COLE & Co.**

**BALTIMORE  
COPPER WORKS,**

No. 57 South Gay St., BALTIMORE, MD.,

Have always on hand and for sale

**INGOT COPPER,**

Also Cakes, of unequalled purity and toughness.



**G. Gunther,**  
Manufacturer of  
Patented Brass, Silver Plated  
and Japanned  
**BIRD CAGES.**  
Can be nested for export shipments.  
46 Park Place,  
NEW YORK.

Largest variety in patterns and unsurpassed in low prices. New Illustrated Catalogues and Price Lists on application.

**FOUNDRYMEN'S METALLIC  
Pattern Letters and Figures,**  
To put on patterns of castings. All sizes. Reduced prices. Mfg. by H. W. Knight, Seneca Falls, N.Y.

**Bergen Port Spelter.**

MINES: WORKS & FURNACES,  
Lehigh Valley, Pa. Bergen Port, N. J.  
The only Miners and Manufacturers of

**PURE  
LEHIGH  
SPELTER**

From Lehigh Ore.

Especially adapted for

Cartridge Metal and German Silver.

Also manufacturers of

**BERGEN PORT OXIDE ZINC.**  
Superior for LIQUID PAINT on account of its body and wearing properties.

**BERGEN PORT ZINC CO.**  
E. A. FISHER, Agent, 13 Burling Slip, N. Y.

CALVIN WELLS, A. MEANS,  
President, Manager.

**ILLINOIS ZINC CO.,**

MANUFACTURERS OF

**SHEET ZINC,**

PERU, ILLINOIS.

E. A. FISHER, . . . Agent,  
13 Burling Slip, New York.

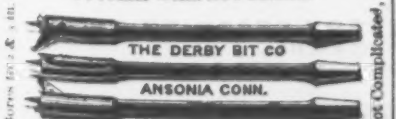
**SMITH'S NEW MODEL  
REVOLVERS.**



Sold by Gun and Hardware  
Trade Everywhere.

OTIS A. SMITH, Manufacturer, Rockfall, Ct.

CUTTERS WILL NOT BREAK.



DURABLE, STRONG, CONVENIENT.

**MORRIS, WHEELER & CO.,**  
IRON, STEEL & NAILS.

WAREHOUSE and OFFICES, 16th & Market Sts.,  
PHILA., PA. SALES OFFICES,  
400 Chestnut St.,  
PHILA., PA.  
New York Address, 14 CLIFF ST.

**TIRE STEEL.**

We shall hereafter make two grades of steel tire, which we shall label as follows:

**1st. GAUTIER TIRE.**—From solid ingots of special steel, made for this purpose only. Carefully rolled, most rigidly inspected—perfectly straight, exact gauge, easy to weld and *always uniform* in temper. In fact, the best tire made.

Round or square edge standard lengths, 12½ and 13½ feet. Cut to specific lengths without extra charge.

**2d. CAMBRIA TIRE.**—Exactly the same quality and finish as we have so long sold and which has gained us so large a reputation. Fully equal to any first-class tire produced anywhere. Made entirely from new, sound stock. (No rail ends or crops of any kind used.) Rolled, straightened and inspected same as above, and precisely similar in external appearance, the difference being in the fact that "Gautier" brand will hereafter be made of more costly and finer quality of stock.

**GAUTIER STEEL DEPARTMENT  
of Cambria Iron Co.,  
[No. 27.] JOHNSTOWN, PA.**

**THE NEW CHAIN.**



SEND FOR CIRCULAR.

**C. W. & H. W. MIDDLETON, Selling Agents,**  
943-945 Ridge Ave. 908-910 and 926-928 Callowhill St. Philadelphia.

**J. A. EMERICK** **HOWARD EVANS,**  
MANUFACTURERS  
**MOLDERS' TOOLS,  
FOUNDRY FACING,  
MOLDING SAND,  
FOUNDRIY SUPPLIES,  
J. A. EMERICK & CO.,  
1056 to 1076 Beach St., PHILADELPHIA.**

ESTABLISHED 1837.  
H. S. CHASE, Sec'y.

INCORPORATED 1876.  
C. F. POPE, Treas.

**Waterbury Mfg. Co.,  
WATERBURY, CONN.**

**Brass Goods.**

**RIVERSIDE  
FOUNDRY  
WORKS.** **ROLLING MILL AND MACHINERY  
CASTINGS, ROLLS,  
CLEVELAND, OHIO.  
INGOT MOLDS, ANNEALING POTS,  
HOT BLAST PIPE, &c.**

**FOR STEEL REFINERS.**

**WE OFFER AUSTRIAN CHARCOAL HAMMER STEEL,**

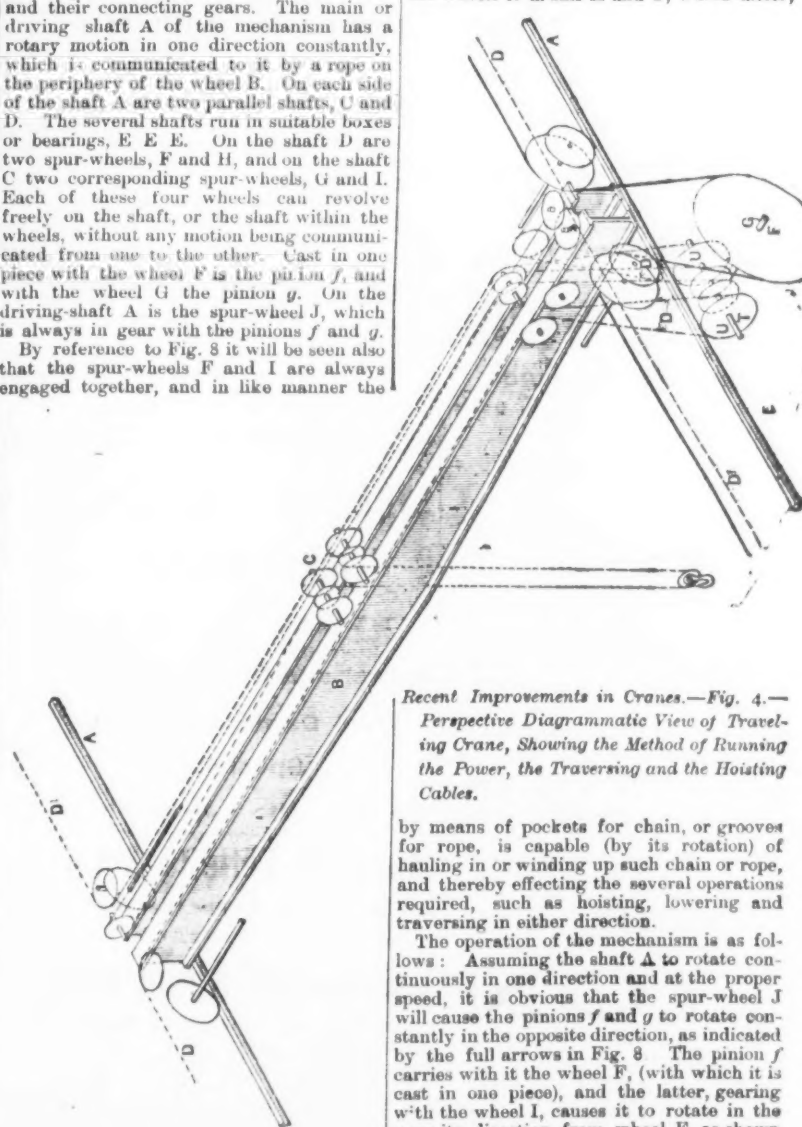
In Flat Bars, deliverable in quantities to suit, in bond or duty paid.

Correspondence solicited. Sample Bars on hand.

**WOLTMAN & MICKERTS, No. 5 N. Second St., St. Louis, Mo.**

simultaneously and at equal speeds. This is fully accomplished by the mechanism shown in Figs. 8, 15, 16, of which Fig. 15 is a plan or top view, Fig. 16 an elevation or side view, and Fig. 8 an end view of the three shafts and their connecting gears. The main or driving shaft A of the mechanism has a rotary motion in one direction constantly, which is communicated to it by a rope on the periphery of the wheel B. On each side of the shaft A are two parallel shafts, C and D. The several shafts run in suitable boxes or bearings, E E E. On the shaft D are two spur-wheels, F and H, and on the shaft C two corresponding spur-wheels, G and I. Each of these four wheels can revolve freely on the shaft, or the shaft within the wheels, without any motion being communicated from one to the other. Cast in one piece with the wheel F is the pinion f, and with the wheel G the pinion g. On the driving-shaft A is the spur-wheel J, which is always in gear with the pinions f and g. By reference to Fig. 8 it will be seen also that the spur-wheels F and I are always engaged together, and in like manner the

L is the chain-wheel, barrel or drum, Y, and to the worm-wheel N a corresponding chain-wheel, barrel or drum, X. When in use a chain or rope is passed around each of the wheels or drums X and Y, which latter,



Recent Improvements in Cranes.—Fig. 4.—  
Perspective Diagrammatic View of Travel-  
ing Crane, Showing the Method of Running  
the Power, the Traversing and the Hoisting  
Cables.

by means of pockets for chain, or grooves for rope, is capable (by its rotation) of hauling in or winding up such chain or rope, and thereby effecting the several operations required, such as hoisting, lowering and traversing in either direction.

The operation of the mechanism is as follows: Assuming the shaft A to rotate continuously in one direction and at the proper speed, it is obvious that the spur-wheel J will cause the pinions f and g to rotate constantly in the opposite direction, as indicated by the full arrows in Fig. 8. The pinion f carries with it the wheel F, (with which it is cast in one piece), and the latter, gearing with the wheel I, causes it to rotate in the opposite direction from wheel F, as shown by the dotted arrow, Fig. 8. In like manner the pinion g carries the wheel G, which in turn gears with the wheel H, and drives the latter in the opposite direction to that of G. It will thus be seen that with the shaft

spur-wheels G and H, whence it follows that wheels F and I are always running in contrary directions, as also are wheels G and H. Within the wheels F, G, H and I are a series of disks, which constitute the West-

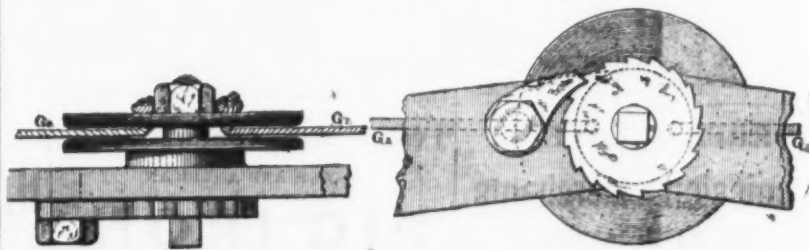


Fig. 5.—Detail of Trolley Locking Mechanism.—Ends of Rope G<sub>1</sub>, G<sub>2</sub> Connected to Winch on Trolley.

Fig. 6.—Detail of Trolley Locking Mechanism.—Ratchet and Pawl for Keeping Rope G<sub>1</sub>, G<sub>2</sub> Taut.

ton patent frictional disk-clutch. O, P, Q and R are four sliding hubs or followers, the keyed or pinned to the shafts C and D, so as always to rotate with them, but capable of a moderate longitudinal motion on these

A and wheel J running in one direction—say, to the left—the pinions f and g and the wheels F and G will run in the contrary direction—that is, to the right—while the motion of the wheels I and H will be re-

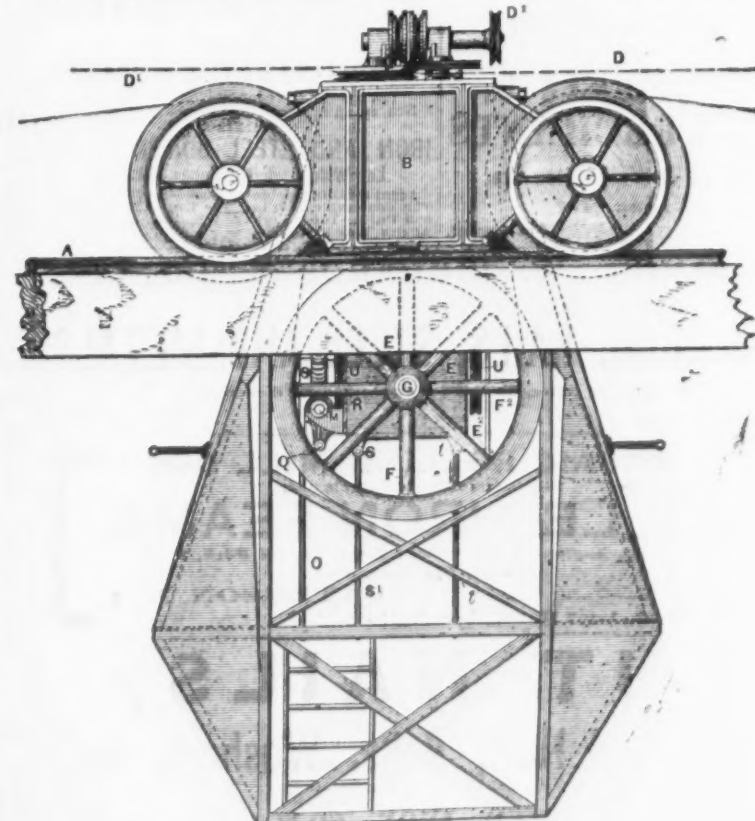


Fig. 7.—End Elevation of Crab End of Traveling Crane.

versed, so that the latter run to the left, like the shaft A. There are therefore on each of the shafts C and D two wheels in constant revolution, one of which turns to the right and the other to the left, but all of which run loose on their shafts. Now, by moving either one or the other of the sliding-hubs or followers O, P, Q and R

shafts. For imparting the requisite end pressure to cause the engagement of the several clutches, a toggle device, patented also by Mr. T. W. Capen, is employed. The shafts C and D carry each respectively the worms M and K, which in turn engage with and drive the worm-wheels N and L. These worm-wheels revolve freely on the fixed shaft Z. Bolted rigidly to the worm-wheel



## OGDEN & WALLACE,

85, 87, 89 &amp; 91 Elm St., New York.

### Iron and Steel

Of every description kept in stock.

Agents for Park Brother & Co.'s  
**BLACK DIAMOND STEEL.**  
All sizes of Cast and Machinery Steel constantly on hand.

## PIERSON & CO.,

24 Broadway, New York City.

### Iron & Steel.

**COMMON & REFINED IRON,**  
Hoops, Rods, Scrolls, Bands, Ovals,  
Horse Shoe, Nail Rods,  
Steel, &c.

Orders promptly filled from stock.

## ABEEL BROS.,

190 SOUTH ST., NEW YORK.  
365 WATER ST.,

"ULSTER" IRON,  
"CATASAUQUA" IRON,

ALLENTOWN SHAFTING,

COMMON IRON,

And full assortment of sizes of the best brands of

REFINED IRON,

Band, Hoop, Scroll and Angle Iron. Cast, Spring,  
Toe-Calk and S. S. Steel.

TELEPHONE CALL, "NASSAU, 379."

A. R. WHITNEY & CO.,  
Manufacturers of and Dealers in

## IRON

### AGENCIES:

PORTAGE IRON CO., Limited, Merchant Iron.

RAMONDALE IRON WORKS, Merchant Iron.

NORWAY IRON AND STEEL WORKS, Homo-

geneous Steel Plates.

RAY STATE IRON CO., Tank, Boiler and Girder

Plates.

H. P. NAILS CO., Wire Nails.

BRANDYWINE ROLLING MILL, Boiler Plates.

GLASGOW TUBE WORKS, Boiler Flues.

A. M. BYERS &amp; CO., Wrought Iron Pipe.

CARNAGIE BROS. &amp; CO., Limited, Wrought

Iron Beams, Channels and Shapes.

Plans and estimates furnished, and contracts

made for erecting Iron Structures of every descrip-

tion. Books containing cuts of all iron made sent

on application by mail.

Sample pieces at office. Please address

58 Hudson Street, New York.

BORDEN &amp; LOVELL,

Commission Merchants,

70 &amp; 71 West St.,

L. S. LOVELL, } NEW YORK.  
C. A. GREENE, }  
H. L. FREEDLAND, }

Agents for the sale of

Fall River Iron Co.'s Nails,

Bands, Hoops &amp; Rods,

AND

Borden Mining Company's

Cumberland Coals.

WILLIAM H. WALLACE &amp; CO.,

IRON MERCHANTS

Cor. Albany &amp; Washington Sts.

NEW YORK CITY.

WM. H. WALLACE. WM. BISHOP.

DANIEL W. RICHARDS &amp; CO.,

FOREIGN AND DOMESTIC

### SCRAP IRON, RAILS, STEEL AND METALS.

Yards and Office, 88 to 96 Mangin St., NEW YORK.

DANIEL W. RICHARDS.

MORTON B. SMITH.

## PASSAIC ROLLING MILL CO.,

Manufacture and have always in stock

### ROLLED IRON BEAMS,

Channels, Angles, Tees, Merchant Bars, Riveted Work, For-

gings, Eye Bars, &amp;c.

PATERSON, N. J.

Room 45, Astor House, New York.

## CUT NAILS,

Hot Pressed Nuts, Bolts, Washers, &amp;c.

DOVER IRON CO.'S

### BOILER RIVETS,

Boiler Brace Jaws, Socket Bolts, &amp;c.

## FULLER BROTHERS & CO.

139 Greenwich Street, New York.

## A. B. Warner & Son,

### IRON MERCHANTS,

28 &amp; 29 West and 52 Washington Sts.

### IRON & STEEL BOILER PLATE.

### BOILER TUBES,

Angle, Tee and Girder Iron.

Boiler and Tank Rivets.

Sole Agents for the celebrated

LUKENS, PENNOCKS, "WAWASSET," "EUREKA."

brands of Iron. Also all descriptions of Plate, Sheet,

and Gasometer Iron. Special attention to Locomotive

Iron. Fire Box Iron a specialty.

## ROME MERCHANT IRON MILLS,

ROME, N. Y.,

Manufacturers of the best grade of

Bar Iron, Bands and Fine Hoops.

Scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and

Horse Shoe Iron. Also from Charcoal Pig a superior

quality of iron branded J. G. All puddled balls re-

duced by hammer. Orders may be sent to the Mill or

to J. O. CARPENTER, our Agent, at 59 John

Street, New York.

## SYRACUSE MALLEABLE

### IRON WORKS,

SYRACUSE, N. Y.

Mower and Reaper Castings

and Carriage Irons a

Specialty.

W. B. BURNS, Proprietor.

## Marshall Lefferts & Co.,

90 Beekman St., New York City,

MANUFACTURERS OF

### Galvanized Sheet Iron,

Best Bloom, Best Refined and Common.

Galvanized Wire, Telegraph and Fence; Galvanized

Hoop and Band Iron, Galvanized Rod and Bar Iron,

Galvanized Nails, Galvanized Chain, Galvanized Iron

Pipe.

### CORRUGATED SHEET IRON

For Roofing, &amp;c., Galvanized, Plain or Painted

Best Charcoal, Best Refined and Common

### SHEET IRON.

Plate and Tank Iron,

C No. 1, C H No. 1, C H No. 1 Flange, Best Flange,

Best Flange Fire Box, Circles.

ALL DESCRIPTIONS OF

Iron Work Galvanized or Tinned to Order.

Price list and quotations sent upon application.

## JAMES WILLIAMSON & CO.,

SCOTCH AND AMERICAN

### PIC IRON,

No. 63 Wall St., New York.

## ULSTER IRON WORKS

90 Broadway, New York.

## Tuckerman, Mulligan & Co

## CARMICHAEL & EMMENS

130, 132 &amp; 134 Cedar St., New York, and

Nos. 21, 23, 25 &amp; 27 West Lake St., Chicago, Ill.

DEALERS IN

### IRON AND STEEL BOILER PLATE.

Lap-Welded Boiler Tubes, &amp;c. &amp;c.

Agent for Otis' celebrated Cast Steel Boiler Plates,

The Costello Iron Co. The Laurel Rolling Mills,

and Union Tube Works; Wrought Iron Beams,

Angles, Tees, Rivets, &amp;c.

## OXFORD IRON CO.,

(B. G. CLARKE, Receiver.)

### Cut Nails

AND

### SPIKES.

J. S. SCRANTON, Sales Agent,

81, 83 and 85 Washington Street,

NEW YORK.

## JOHN W. QUINCY & CO.,

98 William Street, New York.

### Anthracite & Charcoal Pig Irons,

Wrought Scrap, Cut Nails, Copper,

BLOCK TIN, LEAD, SELLER, ANTIMONY, NICKEL, &amp;c.

## HARRISON & GILLOON

IRON AND METAL DEALERS,

558, 560, 562 WATER ST., &amp; 302, 304, 306 CHERRY ST.,

NEW YORK.

Have on hand, and offer for sale, the following:

Scotch and American Pig Iron, Wrought, Cast and

Machinery Scrap Iron, Car Wheels, Axles and Heavy

Wrought Iron; also old Copper, Composition, Brass,

Lead, Pewter, Zinc, &amp;c.

## BURDEN'S

### HORSE SHOES.

"Burden Best"

Iron

### Boiler Rivets.

The Burden Iron Company

Troy, N. Y.

## ULSTER

AND

### BURDEN'S

### H. B. & S. Bar Iron.

Also Best Grades of

American &amp; English Refined Iron.

All sizes and shapes in stock.

## EGLESTON BROS. & CO.,

166 South St., NEW YORK CITY.

## VOUGHT & WILLIAMS,

288 Greenwich Street,

NEW YORK

Dealers in

### Horse Shoes, Horse Nails,

BELLOWS, FORGES, VISES

Tuyere Irons, Carriage and Tire Bolts,

RASPS AND FILES,

Drilling Machines, Hammers and

Sledges.

## B. F. JUDSON,

Importer of and Dealer in

### SCOTCH AND AMERICAN

### Pig Iron,

Wrought &amp; Cast Scrap Iron,

### OLD METALS.

457 &amp; 459 Water St., NEW YORK.

233 &amp; 235 South St.,

## Manhattan Rolling Mill.

J. LEONARD,

445 to 451 West St., 177 &amp; 179 Bank St.,

NEW YORK,

Manufacturer of

### HORSE SHOE IRON,

Toe Calk Steel,

Rods, Ovals, Half Ovals and Flats.

## DANIEL F. COONEY,

88 Washington St., N. Y.

BOILER PLATES AND SHEET IRON,

LAP-WELDED BOILER FLUES,

Boiler Rivets, Angle &amp; T Iron, Cut Nails &amp; Spikes.

Agency for Glasgow Iron Co., Jos. L. Bailey &amp; Co.,

Pine Iron Works, Lebanon Rolling Mills, Chester

Pipe and Tube Co., Albany &amp; Reus. Iron &amp; Steel Co.'s

celebrated Boiler Rivets; Homogeneous Steel, Boiler

and Fire Box Plates.

## W. D. WOOD & CO.'S



### PATENT

### Planished Sheet Iron.

Patented March 14th, 1865; April 8th, 1873;

Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the

IMPORTED RUSSIA IRON,

and at a much less price.

### FOR SALE

by all the principal

### METAL DEALERS

in the Large Cities throughout

### THE UNITED STATES,

And at their Office,

111 Water Street, PITTSBURGH, PA.

FRANK L. FROMENT,

112 John St., NEW YORK.

### IRON AND STEEL.

AGENT FOR

Pencey Iron Works,

Malden Iron Co.,

Marshall Iron Co.,

Still Water Co., Iron Beams, Hoop &amp; Band Iron.

## W. S. MIDDLETON,

### Broker in Machinery & Iron

Agent for

FORSTER'S CRUSHER &amp; PULVERIZER,

The best in market.

W. S. MIDDLETON, 52 John St., N. Y.

## C. W. LEAVITT,

161 Broadway,

NEW YORK.

NEW AND SECOND-HAND

### Rails and Railway Equipment

PIG and BAR IRON, OLD RAILS and SCRAP.

General Agent ALLENTOWN ROLLING MILLS.

Agent for PARDEE CAR &amp; MACH. WORKS.

## KINNEIL

### SCOTCH PIG IRON,

FOR SALE IN LOTS TO SUIT,

EDWARD J. WESSELS

SOLE AGENT FOR THE

UNITED STATES,

17 Cedar St., - - NEW YORK.

## F. W. JESUP & CO.,

Railway Supplies and Equipment.

No. 67 Liberty St., NEW YORK.

Agents NASHUA IRON AND STEEL CO.,

Manufacturers of

STEEL LOCOMOTIVE TYRES, HOMOGENEOUS

STEEL BOILER PLATES, IRON AND STEEL AXLES,

CRANK PINS, PISTON RODS, SLIDES, &amp;c.

IRON AND STEEL LOCOMOTIVE FORGINGS.

## GLENGARNOCK AND CARBROE SCOTCH PIG IRON.

For spot delivery and for prompt or forward shipments to New York, Boston, Philadelphia,

Baltimore or New Orleans. For sale in lots to suit by

JAMES LEE &amp; CO., Sole Agents for the United States.

72 Pine Street, NEW YORK.

101 Milk Street BOSTON, MASS.

## LEECHBURG IRON WORKS.

KIRKPATRICK &amp; CO.,

Manufacturers of all grades of

### FINE SHEET IRONS

(Refined Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel, Ferrule Iron, &amp;c.)

NATURAL GAS USED AS FUEL.

OFFICE, No. 143 First Ave., Pittsburgh, Pa.

WORKS, Leechburg, Pa.

## CHARLES HUBBARD,

"SHERIDAN," "LEESPORT,"

"MT. LAUREL" &amp; "TEMPLE" BRANDS PIG IRON.

"CHARCOAL" PIG IRON, "MAIDEN CREEK" and "NEW RIVER MINERAL" BRANDS.

FAVORITE BRANDS OF SCOTCH PIG IRON IN STOCK AND TO ARRIVE.

Old Car Wheels, Best Brands.

46 Cliff Street, New York City.

## JAMES W. ROSS,

IMPORTER OF AND FURNACE AGENT FOR

### SCOTCH AND AMERICAN PIG IRON.

MANUFACTURERS' AGENT OF



## Siemens' Regenerative GAS FURNACE.

**RICHMOND & POTTS,**  
119 S. Fourth St., PHILADELPHIA, PA.

## HENRY LEVIS & CO., Manufacturers' Agents

For Iron and Steel Rails, Car Wheels, Boiler and  
Sheet Iron and General Railway  
Equipments,  
Old Rails, Axles, and Wheels bought and sold.  
234 S. 4th St., Philadelphia.

## The Cambria Iron and Steel Works,

Having enjoyed for over TWENTY-FIVE YEARS the reputation of producing the best quality of

### RAILS,

have now an annual capacity of

230,000 Tons of Iron and Steel Rails, Splice Bars, &c.

ADDRESS,  
**CAMBRIA IRON COMPANY,**  
No. 218 South 4th Street, Philadelphia.  
Or at the Works, JOHNSTOWN, PA.  
Or LENOX SMITH, New York Selling Agent, 46 Pine St., N. Y.

## THE PHOENIX IRON CO.,

410 Walnut Street, PHILADELPHIA.  
Manufacturers of Wrought Iron

Beams, Deck Beams, Channels, Angle & Tee Bars,  
STRAIGHT AND CURVED TO TEMPLATE.

Largely used in the construction of Iron Vessels, Buildings and Bridges.

WROUGHT IRON ROOF TRUSSES, GIRDERS & JOISTS,  
and all kinds of Iron Framing used in the construction of Fire Proof Buildings.

PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,  
and built up shapes for Iron Bridges.

REFINED BAR, SHAFTEING, and every variety of SHAPE IRON made to order.

Plans and Specifications furnished. Address **DAVID REEVES, President.**  
NEW YORK AGENTS, MILLIKEN & SMITH, 95 Liberty Street.  
BOSTON AGENTS, FRED. A. HOUDLETTE & CO., 19 Battery March St.

## ALAN WOOD & CO.,

MANUFACTURERS OF

Patent Planchet, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom

## PLATE & SHEET IRON.

No. 519 Arch St., Philadelphia, Pa.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack,  
Tank and Boat Iron; Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

NAILS


## JAS. ROWLAND & CO.,

Kensington Iron, Steel & Nail Works,  
290 North Delaware Ave., - PHILADELPHIA,  
Manufacturers of the  
**ANVIL BRAND REFINED MERCHANT BAR IRON.**  
Also, the James Rowland & Co. Kensington ★ Nails, cut from  
their Refined Anvil stock. Also, Plow and Cultivator Steel; Skelp  
Iron a specialty; also Rounds, Squares, Flats, Bands and Hoop  
Iron.

## PENCOYD IRON WORKS.

## A. & P. ROBERTS & CO.,

Manufacturers of  
**CAR AXLES.**  
BAR, ANGLE, TEE AND CHANNEL IRON.  
Office, No. 265 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.



NAILS

## J. W. PAXSON & CO.,

DEALERS IN  
**MOULDING SAND,**  
1021 North Delaware Avenue, PHILADELPHIA, PA.,



MANUFACTURERS  
OF MINERAL,  
XX MINERAL,  
IXL FACING,

CHARCOAL FACING,  
ANTHRACITE FACING,  
SOAPSTONE,

LEAD FACING,  
RIDDLES, SHOVELS,  
STEEL BRUSHES.

NAILS

## ALLENTOWN ROLLING MILL COMPANY,

Manufacturers of  
Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes,  
Rivets, Bolts and Nuts, &c. Bridges and Turn Tables.  
General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.  
JAMES C. BOOTH. THOMAS H. GARRETT. ANDREW A. BLAIR.

NAILS

## BOOTH, GARRETT & BLAIR,

Analytical and Consulting Chemists,  
919 and 921 Chant St. (10th St. above Chestnut St.), PHILADELPHIA PA.  
Established in 1836.  
Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the  
**ANALYSIS OF IRON AND STEEL,**

Fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron Steel, Iron  
Ores, Slags, Limestones, Coals, Clays, Fire Sands &c. Agents for sampling ores in New York and  
Baltimore. Price lists on application.

NAILS

## SHENANDOAH IRON, LUMBER, MINING & MFG. CO.,

MANUFACTURERS OF

NAILS

## SUPERIOR COKE PIG IRON

FROM NEUTRAL HEMATITE ORES. Also  
CHARCOAL PIG IRON AND BLOOMS FROM SAME ORES.  
Works at MILNES, PAGE CO., VA. Treasurer's Office, 232 WALNUT ST., PHILADELPHIA.  
JUSTICE COX, JR. & CO., Sales Agents, 224 South 4th St., Philadelphia.

NAILS

## Edward J. Etting,

IRON BROKER AND COMMISSION MERCHANT,  
222 S. Third St., Philadelphia, Pa.  
**Pig, Bar and Railroad Iron.**  
OLD RAILS, SCRAP, &c.  
Agent for the

NAILS

## MOUNT SAVAGE FIRE BRICK,

The Allentown Iron Co. and the  
Greenwood Rolling Mill.  
STORAGE WHARF AND YARD  
DELAWARE AVENUE ABOVE CALLOWHILL STREET,  
connected by track with railroad.  
Cash advances made on iron.

NAILS

## JOS. J. LIPPINCOTT & CO.,

Dealers in American, English and Scotch  
**PIG IRON,**  
131 So. 4th St., PHILADELPHIA.  
Bar Iron, New and Old Rails, Ores, Fire Brick,  
Railway Supplies, &c.  
**SCRAP IRON A SPECIALTY.**

NAILS

## D. W. R. READ & CO.,

Importers and dealers in

## FOREIGN & NATIVE BESSEMER ORES.

NAILS

## PIG IRON ENGLISH FIRE BRICK.

205 1/2 Walnut St., PHILADELPHIA.  
142 Pearl St., 67 Gracechurch St., 67 S. Gay St.,  
NEW YORK. LONDON. BALTIMORE.

Established 1837.  
**A. PURVES & SON,**  
Dealers in

NAILS

## Scrap Iron, Metals and Machinery,

Cor. South and Penn Sts., Philadelphia.  
Offer for sale, in lots to suit, Red or Yellow Heavy  
Scrap Brass; Ingot Brass, best qualities, Ingot Gun  
Metal made strictly from Old Cannon's S. can Pumps,  
Shafting Pulleys, &c. Machinery and Tools vari-  
ous descriptions. Cash paid for Scrap Iron and Metals.  
ISAAC V. LLOYD. JAS. G. LINDSAY.  
**LLOYD & LINDSAY,**  
No. 328 Walnut St., PHILADELPHIA.  
Brokers and General Dealers in  
Iron and Steel, Railway Equipments and  
Supplies, Bar, Plate and Sheet Iron, Pig  
Iron, Rails and Fastenings, Muck Bars,  
Blooms, Boiler Tubes, Wrought Iron Pipe, &c.  
Old Rails and Scrap Iron.  
Florida Yellow Pine, cargo lots.

NAILS

## J. O. RICHARDSON,

No. 232 Dock St., Philadelphia,  
DEALER IN  
**Pig Iron, Merchant Bar Iron  
and Iron Ores.**

NAILS

## J. J. MOHR,

Sole Agent for  
Sheridan, Leesport, Temple,  
Millcreek and Mt. Laurel  
**BESSEMER, FOUNDRY AND FORGE  
PIG IRON,**  
**CHARCOAL PIG IRON.**

NAILS

## HEBERTON & CO.,

Selling Agents and Commission Merchants  
For the sale of  
Pig, Bloom, Plate, Bar, Scrap, Galvanized,  
Black, Sheet, Pipe and Railroad  
**IRON.**  
No. 220 So. 3d St., Phila.  
Charcoal Bloom and Pig a specialty.

NAILS

## JOSEPH P. REED & CO.,

Iron Brokers and Commission Merchants,  
261 S. Fourth St., Philadelphia.  
Sole Agents for  
PER IRON MINING CO., Chester, N. J.  
RIDGEVIEW COAL AND COKE CO., Latrobe,  
J. D. BOYLE'S CONNELLSVILLE COKE.  
HARRISON & WALKER'S FIRE BRICKS.  
MAGNETIC and HEMATITE IRON ORES a specialty.

NAILS

## L. & R. WISTER & CO.,

**IRON BROKERS.**  
Scrap Iron a Specialty.  
Agents for the Clearfield Fire Brick Co.'s  
Fire Bricks.  
No. 230 South 4th St., Philadelphia.

## CUMBERLAND NAIL AND IRON CO.,

MANUFACTURERS OF

"Cumberland" Nails and Wrought Iron Pipe,  
43 North Water Street and 44 North Delaware Avenue, PHILADELPHIA.

NAILS

## J. TATNALL LEA & CO.,

Successors to CABEEN & CO.,  
**IRON COMMISSION MERCHANTS,**  
No. 400 Chestnut Street, Philadelphia.  
BESSEMER, MILL AND FOUNDRY PIG IRON, SKELP IRON, MUCK AND SCRAP BARS NATIVE  
AND FOREIGN ORES, A. A. HUTCHINSON & BRO.'S CONNELLSVILLE COKE.

NAILS

## J. F. BAILEY & CO.,

216 South 4th Street, PHILADELPHIA,  
SELLING AGENTS,  
Pottsville Iron & Steel Co.'s Beams, Angles, Channels, Rails and Bars,  
A. & P. ROBERTS & CO.'S

NAILS

## Car Axles, Plates, Channels, Tees, Angles and Bar Iron.

Universal and Sheared Plates for Bridge and Other Work.  
Special attention given to all kinds of Structural Irons.

NAILS

## CHAINS.

**BRADLEE & CO., EMPIRE CHAIN WORKS,**  
816 Richmond St., Philadelphia.  
Special attention given to the Manufacture of Chains for  
Cranes; Mining and Dredging Chains; "D. B. G." Special  
Crane Chain.

NAILS

## JUSTICE COX, JR.,

CHARLES E. BARNES.  
**AGENTS FOR**  
CHICKIES, CONEWAGO, MONTGOMERY AND  
SHENANDOAH.

NAILS

## Foundry & Forge Pig Iron.

CARBON ROLLING MILL CO., Limited,  
Best Quality Muck Bar.  
**CATASAUQUA MFG. CO.'S**  
Bar, Angle, Skelp and Sheet Iron.  
Shenandoah (Va.) Best Charcoal Blooms.  
No. 224 So. Fourth St., PHILADELPHIA.

NAILS

## BLAKEY & WALBAUM,

206 S. Fourth St., PHILADELPHIA,  
GENERAL MERCHANDISE BROKERS  
SPECIALTIES,  
**NEW AND OLD RAILS,**  
**BLOOMS, BESSEMER PIG,**  
**Spiegeleisen Iron Ores**  
AND  
Railroad Supplies Generally.  
Sole Agents for the United States for  
The North Lonsdale Iron and Steel  
Co., Limited.  
Bessemer Pig Iron, brand "ULVERSTON."  
Malleable Pig Iron, brand "U. H. M."  
N. B. ALLEN & CO.'S DINAS FIRE BRICKS.

NAILS

## JEROME KEELEY & CO.,

206 Walnut Place, Philadelphia.  
SELLING AGENTS FOR  
CHAIR COAL and ANTHRACITE BLOOMS, PIG IRON,  
BAR IRON, SHEET IRON, STEEL and IRON RAILS,  
IRON CLAD STEEL RAILS and BARS, MAGNETIC  
and HEMATITE IRON ORES, FIRE BRICK, COAL  
and OKE, MUCK BARS, Handle Old Iron and Steel  
Rails, Scrap Iron &c. Examine and negotiate sales  
of Iron and Coal properties.

NAILS

## E. H. WILSON & CO.,

230 South Third Street, Philadelphia.  
BROKERS AND DEALERS IN  
**IRON AND STEEL.**  
Correspondence solicited.

NAILS



NAILS

## LOCOMOTIVE AND CAR WHEEL TIRES,

Manufactured from the celebrated OTIS STEEL.  
BRAND  
**STANDARD.**  
Quality and efficiency fully guaranteed. Prices as  
low as any of the same quality. We manufacture  
Heavy and Light Forgings, Driving and Car Axles,  
Cranks Pins, Piston Rods, &c.  
Works at Lewistown, Pa.  
Office, 220 S. 4th St., Philadelphia, Pa.

NAILS

## J. W. HOFFMAN & CO.,

Iron Merchants & Railway Equipments.  
208 South Fourth St., Philadelphia.  
Sole agents Glasgow Iron Co. and Pine Iron Works  
manufacturers of Muck Bar and all grades of Plate  
Iron. Celebrated "Jainzow" and "Pine"  
brands for fire boxes and difficult flanging. Pig and  
Bar Iron, Rails and all shapes in iron. Quotations  
given on Bridge and Building Specifications.

NAILS

## ETHELBERT WATTS,

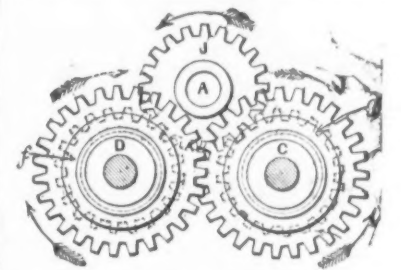
IRON BROKER AND COMMISSION MERCHANT,  
No. 326 Walnut St., Philadelphia.  
Pig, Muck and Bar Iron, Scrap, Etc.  
Also, COKE, IRON ORES, BIT. COAL.

NAILS

## ANDOVER PIG IRON,

FOR BEST MILL PRODUCTS.  
Andover Chill Iron for Car wheels, &c.  
Each pig marked exact chill depth (3/4 inch to 7/8  
inch). A. Whitney & Son's standard test.  
F. A. COMLY, TRG. J. WESLEY PULLMAN, AR. BT.  
407 Walnut St., PHILADELPHIA.

are engaged with the corresponding wheels  
F, G, H, I through the instrumentality of  
the friction-disks V and the toggles U.  
It is thus possible at pleasure to cause the  
rotation of the shaft C to either the right or  
the left, and of the shaft D, in like manner,  
to the right or to the left, or both can be  
rotated simultaneously to the right or both  
to the left, or one to the right and the other  
to the left. The several motions thus ef-  
fected are communicated through the two  
worms and worm-wheels to the chain-wheels



Recent Improvements in Cranes.—Fig. 8.—  
End View of the Three Shafts of the  
Reversing Mechanism and their Connecting  
Gears.

or drums X and Y, causing corresponding  
motions of paying out or taking in the  
chains or ropes attached thereto. By a suit-  
able system of levers or rods the motions of  
the sliding bars S and T can be effected from  
any point where it is desired to have the  
operator stand.

Fig. 3 is a plan view of that end of the  
traveling crane to which the crab mechanism  
is attached, showing the suspended platform  
beneath. Fig. 1 is a side elevation of the  
same, and Fig. 7 an end elevation. As will  
be seen in Figs. 4 and 1, one of the fixed  
cables D' is crossed, which is necessitated

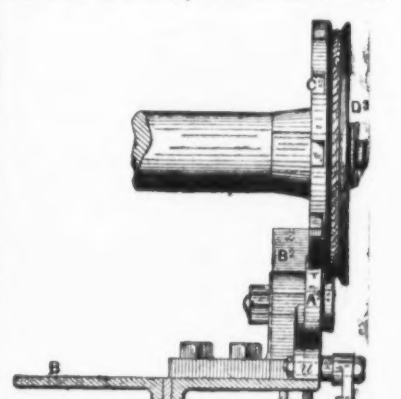


Fig. 9.—End View of Trolley Locking  
Mechanism Shown in Fig. 12.

by the fact that the grip-sheaves revolve in  
the same direction. The result is that,  
although both grip-wheels turn in the same  
direction, the cables will be pulled from the  
two corners on the opposite side of the track,  
and the bridge will be traversed in either  
direction by simply revolving the grip-wheels  
in one direction or the other simultaneously.  
The advantage of thus crossing one of the  
fixed cables is that it saves a separate set of  
gearing to drive one of the grip-sheaves in a  
direction opposite to that of the other. In  
order to prevent the bridge from traveling  
too far upon the tracks, from which acci-

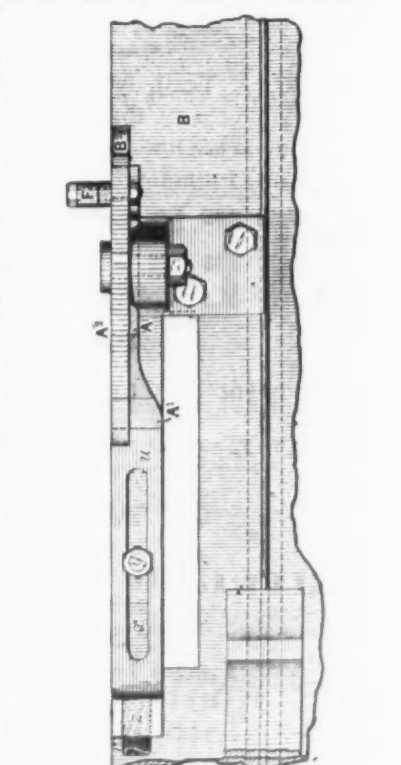
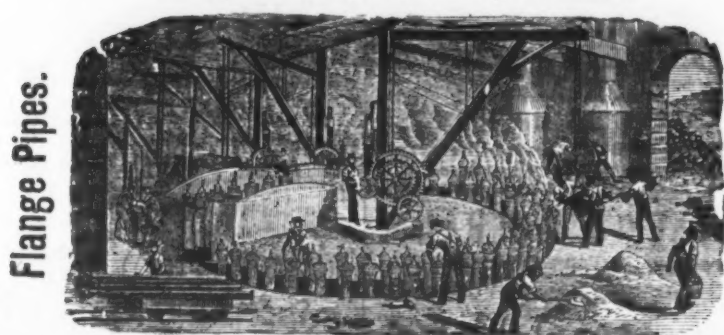


Fig. 10.—Plan View of Trolley Locking  
Mechanism.

dents and damage might result, an auto-  
matic safety-stop mechanism is provided,  
which is illustrated in Figs. 11, 12 and 13,  
where a indicates a lever connected at its  
lower end by an arm, a', to the shipper rod  
Q, pivoted at about its center on the end of  
the shaft T, and connected at its upper end  
to the short arm of a bell-crank lever, b. The  
long arm of this bell-crank lever is con-  
nected by means of two slots, c and d, and  
suitable pins or studs working loosely in the  
slots, with two thrust-rods, e and f, working  
in suitable ways upon the frame of the crab.  
At the proper limit of travel for the bridge,  
near the opposite ends of one of the tracks,  
are provided spring buffers or stops, g and h,  
Fig. 3, of any suitable construction, located  
in the path of the thrust-rods.  
The operation of this automatic stop me-  
chanism is as follows: Supposing the clutches



## A. H. McNEAL, BURLINGTON, N. J.



### CAST IRON PIPES FOR WATER AND GAS.

ESTABLISHED IN 1848.

## SINGER, NIMICK & CO., Limited, PITTSBURGH, PA.

MANUFACTURERS OF ALL KINDS OF  
HAMMERED AND ROLLED

### STEEL.

Warranted Equal to any Produced.

#### BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives,  
Cold-Chisels and Machinists' Tools generally.

#### SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

#### Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,  
Stamping Cold, &c., &c.

#### SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface  
finish and exactness of gauge.

#### ROUND MACHINERY CAST STEEL

For Shafts, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.;  
Cast and German Spring and Flaw Steel.

"Iron Center" Cast Flaw Steel. Finished Rolling Flaw Centers with Patent Screw  
Hubs attached.  
"Soft Steel Center" Cast Flaw Steel. Agricultural Steel cut to any pattern desired.  
"Solid Soft Center" Cast Flaw Steel. Steel Forgings made to order.

Represented at 59 Beckman St., New York, and 417 Commerce St., Philadelphia, by  
HOGAN & SON, General Agents for Eastern and New England States.

## THE MIDVALE STEEL COMPANY, CRUCIBLE AND OPEN-HEARTH STEEL.

### TIRES and AXLES OF EVERY DESCRIPTION.



Tool, Machinery and Spring Steel  
Castings and Forgings.

Works and Office,

Nicetown, Philadelphia, Pa.

Warehouse,

12 N. 5th St., Philadelphia, Pa.

## STEEL FORGINGS

Of all Descriptions.

Address orders to

THE PHILADELPHIA STEEL FORGE, Office, Frankford, Philadelphia, Pa.

GENERAL WESTERN AGENTS,

CHAS. I. WICKERSHAM & CO., No. 232 Lake Street, Chicago.

ESTABLISHED 1847.

## A. WHITNEY & SONS, PHILADELPHIA,

### CHILLED RAILROAD WHEELS

For every kind of service, including Street, Mine and Lumber Trains. Wheels furnished in rough  
bored or on axles. Chilled castings made to order.

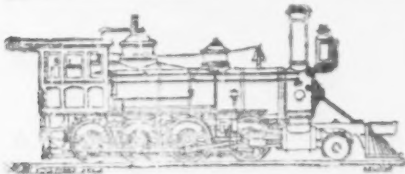
## PENNSYLVANIA STEEL COMPANY, Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.

Address orders to

PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.



### BALDWIN LOCOMOTIVE WORKS.

BURNHAM, PARRY, WILLIAMS & CO., Proprietors.

Philadelphia, Pa., U. S. A.

Manufacturers of

### LOCOMOTIVE ENGINES of every Description.

Catalogues, photographs and estimates fur-  
nished on application of customers.

### NOISELESS STEAM MOTORS,

For city and suburban Railways.

These machines are nearly noiseless in opera-  
tion; show no smoke with the use of anthracite  
coal or coke as fuel, and show no steam whatever  
under ordinary conditions of service. They can  
be run at two or three times the speed of horse-  
power and are economical in fuel.

Illustrated Catalogue with full particulars supplied.

## ROANE IRON COMPANY,

Manufacturers of and Dealers in

### Pig and Railroad Iron.

CHATTANOOGA, - - - - - TENN.

## L. HERNSHEIM,

Manufacturers' Agent and Commission Merchant,

No. 20 NASSAU ST., NEW YORK.

STEEL RAILS, ENGLISH BESSEMER PIG IRON,  
STEEL BLOOMS, FERROMANGANESE,  
STEEL WIRE RODS, SPIEGEL IRON,  
OLD & NEW IRON RAILS, AUSTRIAN CHARCOAL PIG IRON.

## BRITTON IRON AND STEEL CO.,

MANUFACTURERS OF

IRON AND STEEL BOILER PLATE,

Tank, Bridge and Ship Plates,

BLACK AND GALVANIZED SHEET IRON.

Works foot of Wason St., cor. L. S. & M. S. R. R., CLEVELAND, O.

## JACKSON IRON COMPANY,

Manufacturers of Fayette Pig Iron (L. S. Charcoal),  
Stewart Pig Iron (Bituminous Coal and Coke),  
Also, Hammered Blooms, Billets and Muck Bar, extra low in phosphorus, for Siemens Martin and  
Crucible Steel. Miners of Jackson (Lake Superior) Iron Ores.  
FAYETTE BROWN, Gen. Agent. HARVEY H. BROWN, Asst. Gen. Agent. Office, 130 Water St.

## HARVEY H. BROWN & CO.,

AGENTS

CHAMPION IRON CO., } Lake Superior Iron Ores.  
LAKE SUPERIOR IRON CO. }  
Dealers in Pig Iron, Iron Ores and Old Rails.

Offices, 130 Water Street, - - - CLEVELAND, OHIO.

## ORFORD NICKEL AND COPPER COMPANY, SMELTERS AND REFINERS OF COPPER.

THOS. J. POPE & BRO., Agents, 292 Pearl St., New York.

Copper Ore, Matte or Bullion purchased. Advances made on consignments for refining and sale.  
Smelting and Refining Works at Bergen Point, near New York. Offices, 292 Pearl St., New York.

## CHARLES HUBBARD, 46 Cliff St., New York City, HEAVY STEEL AND IRON FORGINGS,

For Marine and Stationary Engines.

Homogeneous Steel Boiler Plate, "Nashua" Brand.

Best YORKSHIRE BAR, "TAYLOR" IRON, for Stamped Work, Screws, etc., etc.

MUSKET SPECIAL TOOL STEEL, requires neither tempering nor hardening.

Estimates given.

ESTABLISHED 1861.

## Jersey City Steel Works.

JAS. R. THOMPSON & CO.,

Manufacturers of all descriptions of

## STEEL.

Warehouse, 93 John Street, New York.

THOS. C. BURROWS, AGENT.

## IRON AND STEEL DROP FORGINGS

All shapes, small and large, including

Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of  
Bricklayers', Monitors', and Plasterers' Tools, Saddlers'  
Round and Head Knives.

## WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

## HOOPES & MERRY,

### WEST SIDE GALVANIZING WORKS,

537 to 547 West 15th Street, New York.

Manufacturers of

The "Lion" and "Phoenix" Brands of Galvanized Sheet Iron.

Corrugated Iron for Roofing or Siding, Tin Plates, Solder, Slatting and Roofing Nails, Tinned, Gal-  
vanized and Black. All kinds of Ironwork Galvanized or Tinned to order.

## BIRMINGHAM ROLLING MILL CO.,

MANUFACTURERS OF

### BAR, BAND AND HOOP IRON,

T-RAILS AND SPLICE BARS.

Also, Street and Tram Rails.

Birmingham, Alabama.

Head Office, Louisville, Ky.

We solicit inquiries for Bar Iron and small Rails. Orders filled promptly.

## CALUMET IRON & STEEL CO.,

MANUFACTURERS OF

### OPEN HEARTH STEEL, PIG METAL,

MERCHANT BAR, IRON AND NAILS,

Offices, First National Bank Building, Chicago, Ill.

C. R. CUMMINGS, President. Works at Cummings, Cook County, Ill.

D. C. BRADLEY, Vice Pres. and Gen'l Mgr. J. M. BROWN, Sec'y & Treas.

## CHEMICALS AND APPARATUS

FOR THE ANALYSIS OF

ORES, IRON, STEEL, FUEL, FLUXES, FURNACE GASES, &c.,

Our Specialty. Being direct Importers and Manufacturers we can offer superior inducements.

EIMER & AMEND, Nos. 205 to 211 Third Avenue.

NEW YORK. Eighteenth Street Station Elevated R. R.

Illustrated Catalogue Mailed on Application.

## CHAS. G. LUNDELL,

No. 7 Exchange Place,

BOSTON,

Mass.

Representing

Ekman & Co.,

COTHENBURG,

SWEDEN.

## WROUGHT IRON

### Boiler Tubes,

Steam, Gas and Water Pipe.

Oil Well Tubing, Casing and

### LINE PIPE.

Cotton Presses, Forgings,

### ROLLING MILL AND

### General Machinery.

## READING IRON WORKS,

261 S. Fourth St. Philadelphia.

## U. S. PATENT FOR SALE

Of a new Bracket for Shafting, successfully intro-  
duced in England, under the title of

### THE "SHAFT CARRIER."

First offered in November, 1881, it has already been  
adopted by many eminent firms. Numerous testi-  
monials, repeated orders and an increasing sale  
prove its superiority.

Sales in the Year 1882 Exceed \$5000.



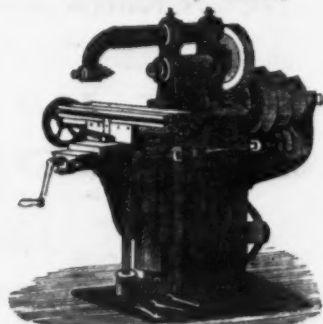
It can be fixed in any position (see cut); is self-  
lubricating and self-adjusting; position of bearing  
variable both vertically and horizontally; easily fixed  
true; causes least possible friction; wears almost  
nil; is cheap; usually supplied from stock.

A MODEL AT INVENTORS' INSTITUTE, NEW YORK.

For prices and further particulars apply to

TAYLOR & CHALLEN, Engineers,  
BIRMINGHAM, ENGLAND.

## W. R. EYNON & SONS, CLEVELAND, OHIO.



MANUFACTURERS OF

MACHINIST TOOLS, MILLING MACHINES,

Die Sinkers, Universal Reeds, Index Centers, Univer-  
sal Vises, Grinding Attachment for Lathes, Centering  
Machines. Gear Cutting and Milling Done.

Office and Works, No. 73 Scranton Ave.

## CORRUGATED AND CRIMPED IRON

ROOFING & SIDING,

Iron Buildings, Roofs,  
Shutters, Doors, Cornices,  
Skylights, Bridges, &c.

MOSELEY IRON BRIDGE AND ROOF CO.

5 Day Street, New York.

## Pennsylvania Agricultural Works, York, Pa.

Parquet's Standard Engines & Saw Mills.

Send for Illustrated Catalogue.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

Address A. B. PARQUET, York, Pa.

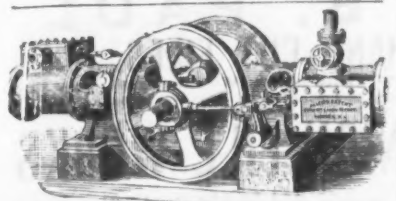


## SILVER & DEMING MFG. CO.,



MANUFACTURERS OF  
Cistern, Pitcher, Well  
and Force Pumps,  
Wind Mill Pumps,  
HAND AND POWER  
ROTARY PUMPS,  
Hydraulic Rams,  
BOILER FEED PUMPS,  
Garden Engines, &c.  
Also, Carriage Makers' Tools,  
Blacksmiths' Drills, Butchers'  
Tools, and Feed Cutters.

Write for Catalogue and Prices.  
**SILVER & DEMING MFG. CO.,**  
SALEM, OHIO, U. S. A.



## AIR COMPRESSORS. ALLEN'S HIGH-SPEED AIR COMPRESSORS

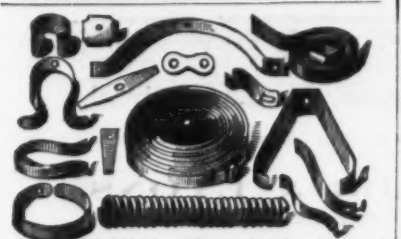
With Positive Moving Valves,  
Allen Engines, Stationary and Marine Boilers  
Hoisting Machinery, Also, Patent Evaporators  
and Condensers for Animal Matters.  
**AIR COMPRESSORS A SPECIALTY.**  
**JOHN McLAREN,**  
River Street, - - HOBOKEN, N. J.



**John Maxheimer.**  
Manufacturer of  
Patented  
**BRASS, BRIGHT  
TINNED WIRE  
& JAPANESE  
Bird Cages.**

The cheapest and most  
salable in market.  
Catalogues and Price  
Lists furnished to the  
Trade.  
947 & 949 Pearl St.,  
New York

Full size of Band for Brass and Tinned Wire Cages.



**DUNBAR BROS.,**

Manufacturers of  
**Clock Springs and Small Springs**  
of every description, from best Cast Steel  
**BRISTOL, CONN.**

**Schenectady Molding Sand Co.**

**ALBANY AND SCHENECTADY  
MOLDING SAND**  
delivered on cars or boats at low rates. All grades  
guaranteed. All orders will receive prompt atten-  
tion. Address: **J. G. GREENE, Sec.,**  
22 Wall St., SCHENECTADY, N. Y.  
G. S. VEDDER, Pres.; J. G. GREENE, Sec. and Treas.

## CLOTHES WRINGERS.



**T. J. ALEXANDER, Manager,**  
BOSTON, MASS.

## HAMMER HANDLES.

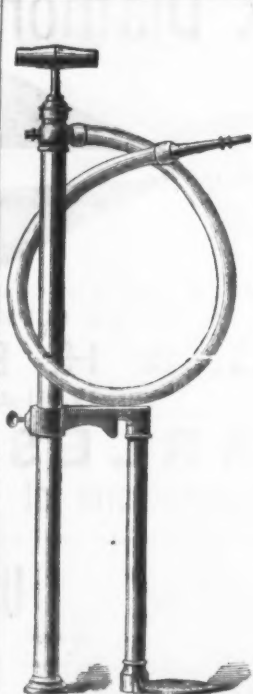
Hammer and Hatchet Handles for  
Tool Makers.

**S. MUSSELMAN & SON,**  
QUAKERTOWN PA., U. S. A.

**UNION BOLT AND NUT WORKS.**  
**THOMAS PARKES,**

MANUFACTURERS OF  
**MACHINE BOLTS, NUTS AND RIVETS**  
Of All Kinds.

Office and Works,  
204 206 & 208 Chicago St., BUFFALO, N. Y.



The above cuts (Fig. 259) represent our **PATENT AQUAPULT**, so valuable a Hand Force Pump  
that certain competitors have made bold to infringe on same, and even to resort to the crime of plagia-  
rism in using our cuts and trade-mark name of article to decoy customers away from our manufacture  
and invention; and we caution the trade and customers against purchasing this article when not made  
by ourselves, as we intend to protect our rights under our patent.

**IF WE ARE THE ORIGINAL AND FIRST INVENTORS OF THIS STYLE  
OF PUMP, AND HOLD VALID LETTERS PATENT ON SAME, AND ANY  
STATEMENT THAT IT HAD BEEN IN THE MARKET PREVIOUS TO OUR  
MANUFACTURE OF SAME IS OF COURSE ABSURD AND WITHOUT THE  
SLIGHTEST FOUNDATION IN TRUTH.**

**W. & B. DOUGLAS, Middletown, Conn.**  
BRANCH WAREHOUSES:  
85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

## UNION MANUFACTURING CO.

Sole Manufacturers of

### SKINNER'S PATENT COMBINATION CHUCK.

Universal, Independent, and Eccentric.

By sliding a stud on the back of Chuck it is instantly  
changed from Universal to Independent, and vice versa.  
Each Chuck is guaranteed perfect. All parts are made  
interchangeable. Only the very best materials used in  
their construction. Reverse or special jaws furnished  
when desired.

We also manufacture

Plain and Ornamental Butts,  
Single and Double Acting Spring Hinges,  
Union Coil Door Springs,  
Galvanized Pump Chain,  
Patent Rubber Buckets,  
Wooden Well Curbs, Wood Tubing,  
Iron and Brass Pumps,  
Patent Copper Pumps,  
Hydraulic Rams, Power Pumps,  
&c., &c., &c.

Write us for Prices.

**Union Manufacturing Co.,**

Warehouse, 96 Chambers St., New York. NEW BRITAIN, CONN.

CHARLES RIDOLEY, President.  
GEO. M. BRINKERHOFF, Secretary

JOHN W. BURN, Vice-President.  
WM. BARRETT RIDOLEY, Assistant Secretary.

## SPRINGFIELD IRON CO.,

MANUFACTURERS OF

### IRON AND OPEN-HEARTH STEEL,

Ingots, Blooms, Billets, Boiler Plate, Spring, Tire, Machinery and  
Agricultural Steels of all Shapes and Sizes.

WORKS AND GENERAL OFFICES:

**SPRINGFIELD, ILL.**

Chicago Office: 111 DEARBORN ST. New York Office: 30 PINE ST.

GEORGE BROOKE, President.

GEO. W. HARRISON, Treasurer.

## THE E. & G. BROOKE IRON CO.,

Birdsboro, Berks Co., Pa.,

Manufacturers of

### ANCHOR BRAND NAILS AND SPIKES.

Capacity 1000 Kegs per Day.

Made from their own Pig Iron, insuring regularity and superiority in quality.

Also, FOUNDRY AND FORGE

**PIG IRON,**

And Cold Blast Charcoal Car Wheel Iron.

## NATIONAL HARDWARE & MALLEABLE IRON WORKS,

Lehigh Avenue, American and Third Streets, Philadelphia.

**THOMAS DEVLIN & CO.,**

MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to  
order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line  
of Carriage and Wagon Castings constantly on hand for the trade.

## BRIDGEWATER IRON CO., Bridgewater, Mass.

Manufacturers of

**SEAMLESS DRAWN BRASS & COPPER TUBES,**

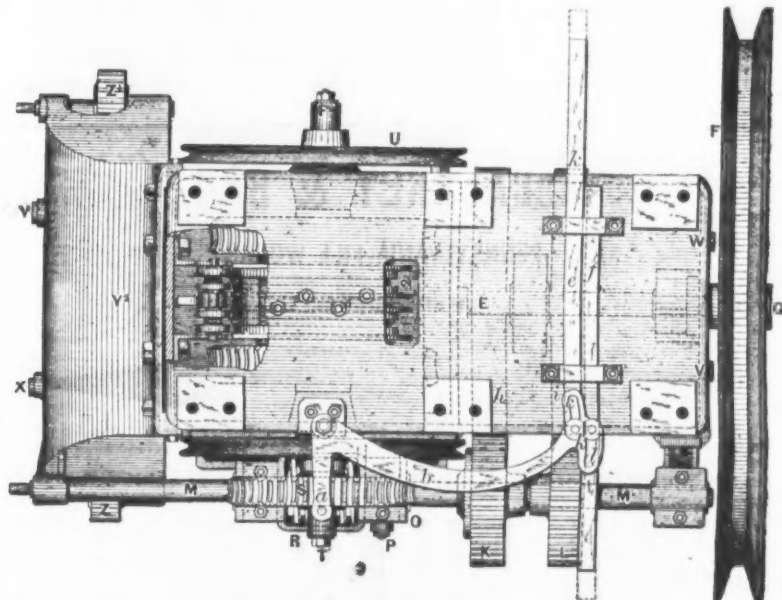
**BRIDGEWATER HORSE NAILS, 34. FINE NAILS,**

**Tack Plates and Forgings of Every Description.**

**NAHUM STETSON, Jr., Agent, 73 Pearl Street, New York.**

to be in the neutral position shown in Fig. 11, when it is desired to move the bridge the shipping lever Q is moved by the operator to the right or left, to engage one or the other of the clutches N, which will result in moving the bridge. The effect of the movement of the shipper-lever will be, through the instrumentality of the bell-crank lever b, to thrust of the spring buffer upon the thrust-rods from extending too far, there is provided a suitable stop upon each thrust-rod, as shown at k, in Figs. 11 and 12.

In order to keep the load from running down, an automatic brake mechanism is applied to each of the two auxiliary shafts. This brake consists in each case of a brake-



Recent Improvements in Cranes.—Fig. 11.—Plan View of Crab Mechanism, with Bridge Removed and the Frame Partly Broken Away to Show Parts Inside of the Crab.

thrust forward one or the other of the thrust-rods e and f into the position indicated in the dotted lines, Fig. 11, and the movement of the bridge will always be in the direction toward which that rod points which is thrust forward. Now, when the bridge arrives near

strap provided with a fixed and a movable lug. A slotted bolt is secured by a screw-thread in the movable lug, and extends down through an opening in the fixed lug, and is provided with a spring between the two lugs. Within the slot of the bolt is a block or fol-

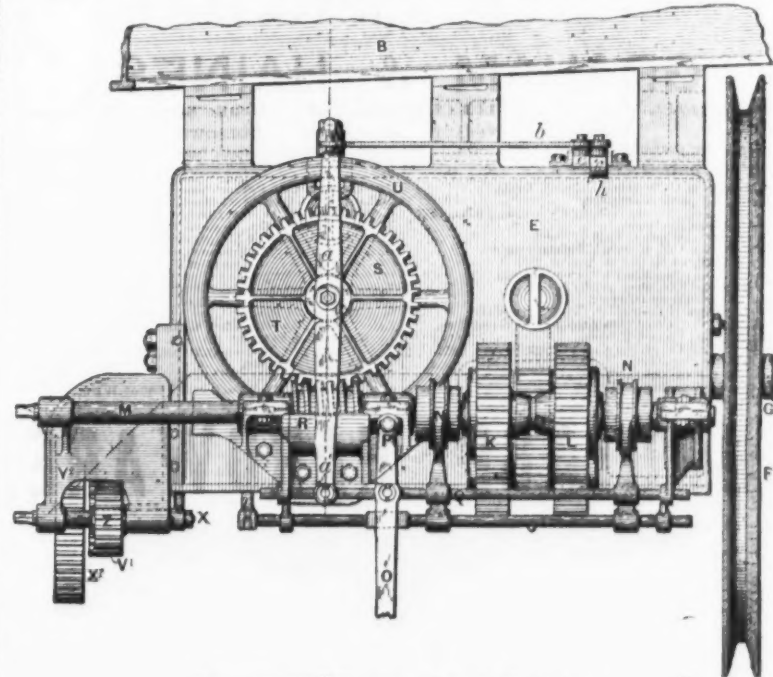


Fig. 12.—Side Elevation of Crab Mechanism.

enough to the end of the tracks, so that the thrust-rod which has been projected outward impinges against the spring buffer or stop, the effect will be that the buffer will push back the advance thrust-rod and move the bell-crank lever and shipper-rod Q, so that the clutch which had been engaged will be

lower with projecting shoulders which extend beyond the bolt, so as to bear against the under side of the fixed lug. Beneath this follower within the slot is a swinging bar or lever having a V-shaped top-bearing, which impinges against the under side of the follower. The result is that when this

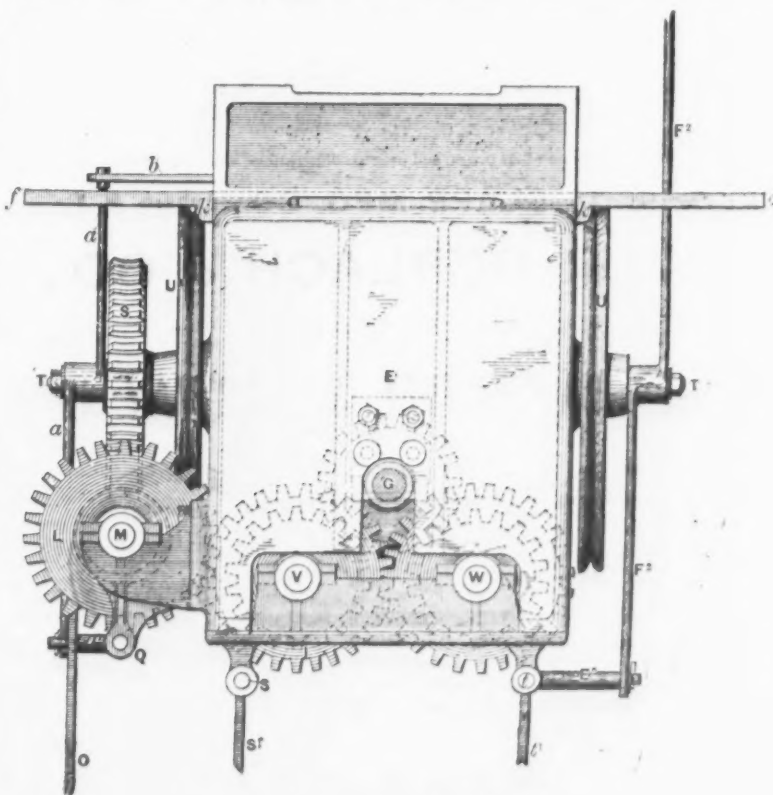


Fig. 13.—End Elevation of Crab Mechanism.

thrust into the neutral position again, and both clutches will then stand in that position, and the propelling power for advancing the bridge will then be cut off. Then the spring buffer will yield to the momentum of the advancing bridge (of course somewhat checking it) until the bridge comes to rest. The slots e and d enable each thrust-rod to be moved the proper distance without moving the other. In order to prevent the inward

swinging bar is in a perpendicular position, the movable lug will be drawn down so as to clasp the brake-strap firmly around the shaft, and thus apply the brake. Whenever the swinging bar is to one side or the other out of the perpendicular position, the movable lug will be raised by the spring and the brake will be released. In order to operate this brake, the swinging bar is jointed at its lower end to an extension of the shipper-rod



## AUBURN FILE WORKS,

Superior Hand-Cut  
**FILES AND RASPS,**  
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.  
**FULLER BROS., Sole Agents,**  
97 Chambers and 81 Reade Streets, N. Y.



**McCAFFREY & BRO.,**

PENNSYLVANIA FILE WORKS

Philadelphia, Pa., U. S.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

**HISCOX** **FILES.** **EQUAL TO THE BEST.**  
FILE MFG. CO., West Chelmsford Mass. Send for Prices.

**DETROIT FILE WORKS,**  
DETROIT, MICH.

The Largest Hand File Works in the U. S.

Manufacturers of **FILES AND RASPS.**  
SEND FOR CATALOGUE.

Proprietors: **ROWE & HAYES, Detroit, Mich.**

**GRAHAM & HAINES,**

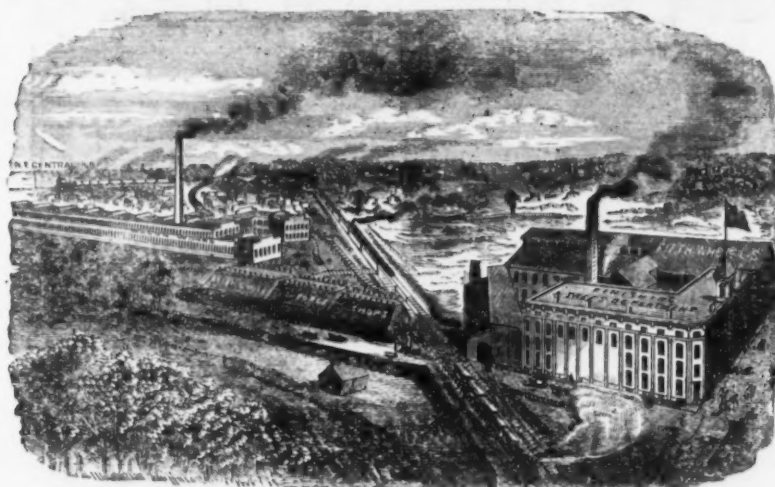
P. O. Box 1042.

113 Chambers and 95 Reade Streets, New York.

**HARDWARE MANUFACTURERS' AGENTS AS FOLLOWS:**  
HOWARD BROS., Cotton, Wool and Curry Cards.  
DEERY & BALL, Scythe Snaths.  
OTTEGO FORD MILLS, Steel Forks, Rakes, Hoes, &c.  
H. KNICKERBOCKER, Scythes, Axes & Tools.  
HEWITT W. KIP, Nail Hammers.  
IRON CITY TOOL WORKS (Limited), Vises, Picks, Mat-locks, Grub Hoes, &c.  
DETROIT BLOCK WORKS, Tackle Blocks.  
FRENCH CASTER CO., Martin's Patent Caster.  
NINICK & BRITTON MFG. CO., Locks, &c.  
SANDUSKY TOOL CO., Planes & Plane Irons.  
GEO. M. EDDY & CO., Measuring Tapes.  
MILES' Alarm Money Drawer.  
NORTHWESTERN HORSE NAIL CO., Horse Nails.  
A. G. COLE & CO., Coe's Genuine Screw Wrenches.  
W. H. HOWELL, Laundry Irons.  
SNODGWICK MFG. CO., Butter and Flour Tryers, &c.  
REASINATHAN PADLOCKS.  
BEST OF ALL EGG-BEATERS.  
HIPLEY MFG. CO., Mouse Traps.

SAM'L LORING, Plymouth Tack and Rivet Works.  
J. BARTLES & CO., Sand and Emery Paper.  
PORTER MFG. CO., Window and Door Screen Corners.  
PAYSON MFG. CO., Perfect Sash Lock.  
J. MALLINSON, Cast Steel Shears & Scissors.  
KETCHAM'S Patent Metallic Saws.  
W. D. TURNER & CO., Geneva Hand Fluters.  
B. S. CLARK, Hand & Sleigh Sells.  
P. LOWENSTRAUT, Compasses, Calipers, Dividers, &c.  
CLARK BROS. & CO., Carriage Bolts, &c.  
LOWERS & TUCKER, The Genuine Knox Plating Mach.  
A. N. BRAGG & CO., N. Y. & Ger. Snaps.  
KENTUCKY BELL CO., "Dodge's" Kentucky Cow Bells.  
O. & H. EUREKA Family Oil Pot and Furnace.  
LANE BROS., Swift's and Grocers' Coffee Mills and Measuring Faucets, &c.  
T. C. RICHARDS HARDWARE CO., Bright Wire Goods.  
Picture Nails, &c.  
W. H. FLACUS & SON, Bellows.  
J. HAIN & CO., "S" Barb Steel Fence Wire.

## CARRIAGE HARDWARE.



Our new Illustrated Catalogue of 140 pages, and over 300 illustrations, will be mailed on application.

**THE E. D. CLAPP MFG. CO., Auburn, N. Y.**

**PETER GERLACH & CO.,**

MANUFACTURERS OF

**SUPERIOR CAST STEEL & NORWAY IRON**



Office & Warerooms, 51 CENTRE ST. CLEVELAND, O. Factories on COLUMBUS & WINTER ST.

**TACKS, NAILS & RIVETS.**

Swedes Iron Upholsterers Gimp, Lace and Card Tacks. Black and Tinned Trunk and Clout Nails. Finishing Nails and Brads; Shoe Nails of Swedes and Common Iron; Copper, Brass & Steel. Lining & Saddle Nails; Tufting Nails and Buttons; Brass and Iron Wire Nails, Molding Nails, Escutcheon Pins, Black and Galvanized Regular and Chisel Pointed Boat Nails.

New York Salesroom, 116 Chambers Street.

**AMERICAN TACK CO., Fairhaven, Mass.**

## Nicholson FILES.

Bandsaw Files,  
Boot Heel,  
Brass,  
Cabinet,  
Cant,  
Cotter Taper,  
Cotter Equaling,  
Cross or Crossing,  
Doctor,  
Drill,  
Feather Edge,  
Finishing,  
Flat,  
Flat Equaling,  
Flat Wood,  
Gang-Edger,  
Ginsaw,  
Gulleting,  
Half-Round,  
Half Round Wood,  
Hand,  
Hand Equaling,  
Handsaw Blunt,  
Handsaw (Double-End),  
Handsaw Taper, single-cut,  
Handsaw Taper, double-cut,  
Handsaw Taper, slim,  
High Back,  
Hook-Tooth,  
Knife,  
Knife Blunt,  
Lead Float,  
Lightning,  
Machine Mill,  
Mill,  
Mill Blunt,  
Mill Pointing,  
Pillar,  
Pitsaw,  
Roaper,  
Roller,  
Round,  
Round Blunt,  
Slotting,  
Slim Handsaw Taper,  
Square,  
Square Blunt,  
Square Equaling Files,  
Stave Saw,  
Three-Square Files,  
Three-Square Blunt Files,  
Tumbler Files,  
Union Cut,  
Warding Files,  
Warding Blunt File,  
Warding Round Edge File.

## RASPS.

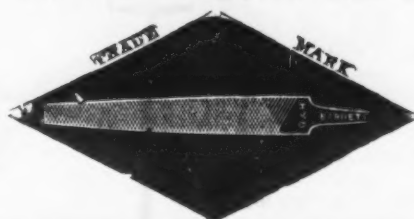
Baker's,  
Beveled Edge,  
Bread,  
Cabinet,  
File, Flat and Half-Round,  
Flat Shoe,  
Flat Wood,  
Half-Round Shoe,  
Half-Round Wood,  
Horse, Plain and Tanged,  
Horse Mouth,  
Jig,  
Oval or French Shoe,  
Racer, Plain and Tanged.

## SPECIALTIES.

Butchers' Steels, Improved,  
Bent Rifflers, Handled,  
File Cards,  
File Brushes,  
Machinists' Scrapers,  
Stub Files & Holder, Detachable.  
Surface File Holder,  
Vise File Holder.

**NICHOLSON  
FILE CO.,**  
PROVIDENCE,  
R. I.,  
SOLE MANUFACTURERS.

## Black Diamond File Works.



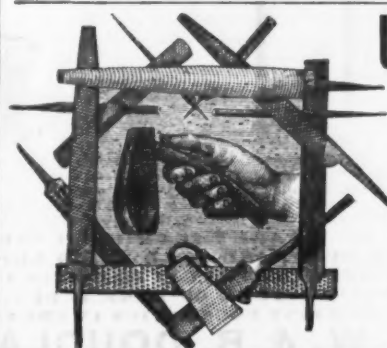
Awarded by Jurors of Centennial Exposition, 1876, for  
"VERY SUPERIOR GOODS."

**G. & H. BARNETT,**

39, 41 & 43 Richmond St., Philadelphia.

**CHARLES B. PAUL,**  
Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 157 Tenth Street, Williamsburgh, New York. All descriptions of Files made to order. Price List mailed on application. Established 1863.



**UNION FILE WORKS**

311 to 315 North St.,  
BALTIMORE, MD.,  
Manufacturers of

**FILES AND RASPS**

Made from the Best Refined Cast Steel.  
With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

**MORITZ & KEIDEL, Agents,**  
48 & 50 German St., Baltimore, Md.

**THRIFT FILE WORKS,**  
Manufacturers of all kinds of  
**Files, Rasps.**



**FILES**  
**JOHNSON & BRO.**  
No. 1 Commercial Street, Newark, N. J.

**FILES! FILES!**

**FILES**  
**NORTHWESTERN FILE WORKS,**

65, 67 and 69 So. Canal St., Chicago.  
Make a specialty of 12 and 14-inch Flat. Will be pleased to hear from parties using the above sizes largely.

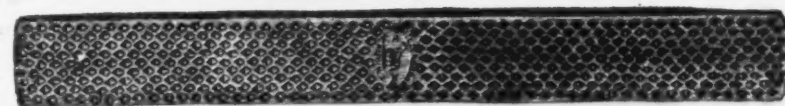
**STOVE REPAIRS.**

Repairs for Stoves made at Troy, Albany, Rochester, Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago, Milwaukee and elsewhere, at  
W. C. METZNER,  
127 W. Randolph St., Chicago, Ill.

**HELLER & BROS., Newark, N. J.,**

Manufacturers of the

**Celebrated Hand-Cut American  
HORSE RASPS AND FILES,**



Made of the best American Steel, and warranted to be unequalled in the market. For sale by Iron and Hardware dealers throughout the United States and Canada.

**DODGE, HELLER & LYONS,**

Manufacturers of all kinds of

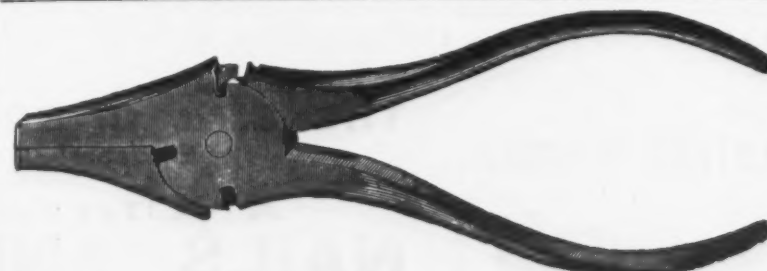
**FINE CLAY CRUCIBLE CAST STEEL,**

ALSO OF DODGE'S PATENT

**FORGING AND GRINDING MACHINES,**

for forging and grinding most articles of tapering or otherwise irregular form. These machines have long been in use in this country and in Europe, and are unequalled for perfection of work and labor saving. We now offer them with the latest improvements.

**WORKS AT NEWARK, N. J.**



**J. M. KING & CO.,**  
WATERFORD, N. Y.,

Manufacturers of the **BUTTONS PATENT**

**"WIRE CUTTER AND PLIER COMBINED."**

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps, Hand, Nut and Screw Taps, Plug Taps and Reamers.

Price List on application.

Established by DANIEL B. KING, 1850

**LIGGETT SPRING AND AXLE CO.,**

LIMITED, MANUFACTURERS OF

**SPRINGS AND AXLES**

For Coaches, Phaetons, Buggies, Wagons, &c.

**Pittsburgh, Pa.**





**TWINE  
BOXES,  
BAG  
FILLERS,  
HAND  
SCOOPS  
&c.**

Send for Illustrated  
Price List.

Manufactured by

**John Chatillon & Sons,**

89, 91, 93 Cliff Street, New York.

### THE Greenfield Vertical Engine



is unequalled by any  
other in workmanship  
and quality of material.  
5% to 30 horse-power.  
Prices lower than any  
other first-class engine.

**COOKE & CO.,**  
DEALERS IN  
**MACHINERY  
AND  
SUPPLIES,**  
12 Cortlandt St.,  
NEW YORK.

In writing, please mention this paper.



**WM. FLACUS & SON, Pittsburgh, Pa.**  
Manufacturers of every variety and all sizes  
Blacksmith's Belows.  
Superior Quality, covered with best Oak Leather Tanning.

### Grant Fan Mill & Cradle Co.

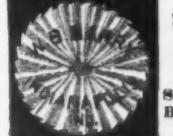
Manufacturers of  
Grant's Grain, Coffee, Rice, Cochineal  
and Pimento Fans,



**TURKEY WING GRAIN CRADLES,**  
4, 5 and 6 fingers.  
**GRAPE VINE GRAIN CRADLES**  
4 fingers.  
**SOUTHERN PATTERN GRAIN  
CRADLES,**  
4, 5 and 6 fingers.  
All of a superior quality.  
None genuine unless marked  
Grant Fan Mill and Cradle Co.  
Send for illustrated catalogue  
and price list.  
P. O. Address,  
MELROSE, Housatonic Co. N. Y.

### HOOSIER SAW WORKS.

W. B. BARRY, Saw Manufacturer,  
132 & 134



South Pennsylvania St.,  
Indianapolis, Ind.

Swages, Gummers, Files,  
Belting & Emery Wheels.  
ALL WORK FULLY WARRANTED

### ESTERBROOK'S STEEL PENS



Leading Numbers: 14, 048, 130, 333, 161.

For Sale by all Stationers.

THE ESTERBROOK STEEL PEN CO.,  
Works, Camden, N. J.

**REMOVED.**

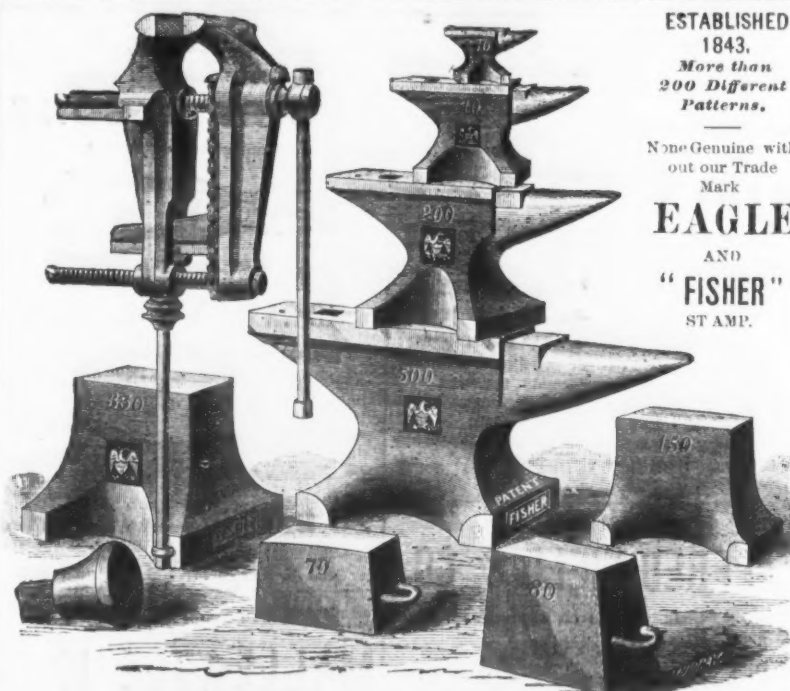
### Medford Fancy Goods Co.

The only exclusive manufacturers of

### DOG GOODS,

101 CHAMBERS STREET,  
Cor. of Church Street.

Send for Illustrated Catalogue 1883.



ESTABLISHED  
1843.  
More than  
200 Different  
Patterns.

None Genuine with  
out our Trade  
Mark  
**EAGLE**  
AND  
"FISHER"  
STAMP.

WARRANTED BETTER THAN THE BEST ENGLISH ANVIL!

Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of  
hardest temper and never to come off or "settle." Horn of tough untempered steel, never to break or  
bend. Only Anvil made in United States fully warranted as above.

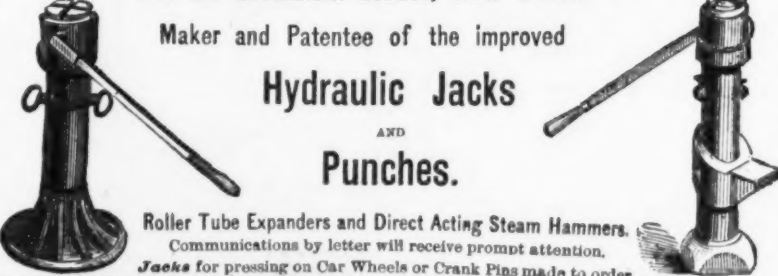
**FISHER DOUBLE-SCREW VISE**

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL.  
Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND  
DURABLE. Send for Circular.

**EAGLE ANVIL WORKS, Trenton, N. J.**

### RICHARD DUDGEON,

No. 24 Columbia Street, New York.



Maker and Patentee of the improved  
**Hydraulic Jacks**  
AND  
**Punches.**

Roller Tube Expanders and Direct Acting Steam Hammers.  
Communications by letter will receive prompt attention.  
Jacks for pressing on Car Wheels or Crank Pins made to order.

### THE ANSONIA CORRUGATED STOVE PLATFORM



With Patented O. G. Border.

**ROUND, SQUARE AND OB-  
LONG, IN ALL SIZES.**

Manufactured of heavy metal, requiring  
no nailing or lining, the edge retaining its  
form. Superior pattern, finish and quality.  
Price as low as any.

Send for List and Discount.

Packed 12 in each case.

### ANSONIA BRASS AND COPPER CO.,

MANUFACTURERS OF

### PURE ELECTRIC WIRE.

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Spiltdorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

### THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Punches, Steamboat and  
Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

### THE ESSEX HORSE NAIL CO., Limited.

#### THE ESSEX HORSE NAILS

Are drawn from the Best Norway Iron Rods only. They are hot forged and cold-  
pointed, rendering them both tough and stiff, and are warranted

**FIRST-CLASS IN EVERY RESPECT.**

By the use of improved machines we forge Fifty per cent. More Nails on a machine  
than any other company, and are thus enabled to sell them proportionately less than any  
other nail of equal quality. All nails branded ESSEX fully guaranteed.

GENERAL AGENTS:

**HOWE & CO., Troy, N. Y.**

**Stanley Rule & Level Co.,**

MANUFACTURERS OF

**Improved  
Carpenters'  
Tools.**



FACTORIES  
New Britain, Conn.

WAREHOUSES,  
29 Chambers St.,  
New York.

Manufacturers of Bailey's Patent Adjustable Planes.  
General Agents for the sale of Leonard Bailey & Co.'s "Victor Planes."  
Manufacturers of "Defiance" Patent Adjustable Planes.

### FOUNDRIES, ATTENTION! FOR THE

**Aiken & Drummond Patent Power Molding Machines**

SEND FOR DESCRIPTIVE CIRCULAR TO

**THE DRUMMOND MFG. CO., Louisville, Ky.**

### LOCKWOOD MFG. CO.,

SO. NORWALK, CONN., MANUFACTURERS OF

**KNOB & DEAD LOCKS, RIM & MORTISE LATCHES,**

Fine Gray Iron Castings, Iron Toys, Metal Patterns &c.

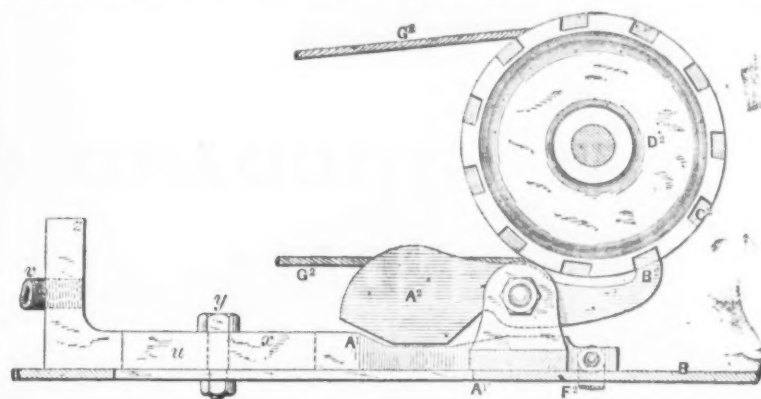
which is operated by the hand-lever, and the  
result is that, whenever the clutch mechanism  
connected with these rods and levers upon  
the auxiliary shafts is in the neutral position,  
the brake will be applied, and when-  
ever the hand-levers, shipper-rods and  
clutch mechanism are so operated as to en-  
gage one or the other of the clutches for the  
purpose of moving the trolley, or of hoisting  
and lowering, the brake mechanism will be  
released.

In many cases it is absolutely essential  
that there should be no motion whatever of  
the trolley when the load is being raised, as  
in the setting of copes and drawing patterns  
in foundry work, where any motion of the  
trolley would be apt to work great damage.  
To accomplish this result a separate brake  
mechanism is provided for this purpose, the  
normal condition of which is to hold the

rope moves at the rate of 5000 feet per min-  
ute) are as follows, viz.:

	Feet per min.
Hoisting and lowering by slow speed.....	1.5
Hoisting and lowering by second speed.....	3.0
Hoisting and lowering by third speed.....	4.0
Hoisting and lowering by quick speed.....	8.0
Travel of bridge on longitudinal tracks.....	10.0
Travel of bridge on longitudinal tracks, slow speed.....	10.0
Travel of bridge on longitudinal tracks, quick speed.....	16.0
Travel of trolley on bridge, slow speed.....	9.0
Travel of trolley on bridge, quick speed.....	24.0

It has been customary heretofore to locate  
the crab mechanism above the bridge, either  
on the trolley or in a fixed position at one  
end of the bridge. This situation of the  
crab is attended with material disadvantages,  
and they are in this crane overcome by sus-  
pending the crab in a suitable manner in a  
fixed position beneath one end of the bridge.  
The result of this is that much greater over-



Recent Improvements in Cranes.—Fig. 14.—Side View of Trolley Locking Mechanism.

trolley absolutely stationary on the bridge,  
and which is only released when it is desired  
to cause the trolley to move. The details of  
construction of this brake are as follows: A  
rope or band, G', Figs. 5, 6, 9, 10, 14, is  
provided, extending around the lock-sheave  
D' on the crab end of the bridge, and around  
the corresponding sheave on the opposite  
end, the ends of the rope being connected  
to a winch upon the trolley, provided with  
a ratchet and pawl for keeping the rope  
taut. These parts are illustrated in detail in  
Figs. 5 and 6. Upon the crab end of the

head room is secured, thus increasing the  
height of hoist possible within a given build-  
ing, and also rendering a suspended platform  
convenient and practicable, so that the op-  
erator can have a better view of the load and  
operations of the crane.

Provision is also made for effecting all  
motions by hand, should the power be dis-  
abled, by applying cranks to a separate train  
of gearing provided for this purpose. A  
suitable platform is provided on which the  
men can stand when operating the hand-  
gear.

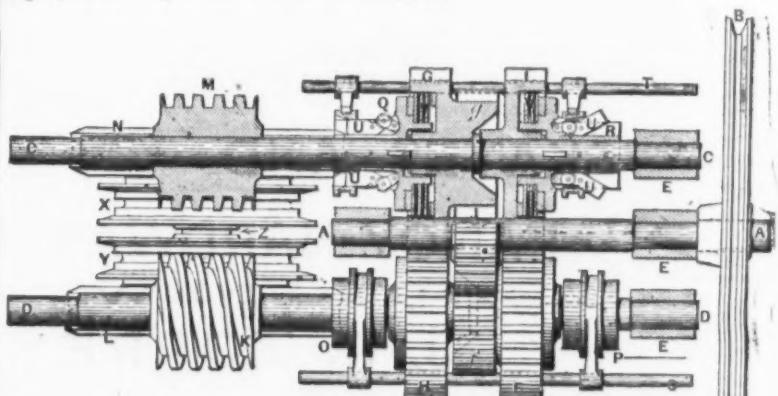


Fig. 15.—Top View of Reversing Mechanism.

bridge is a weighted lever or detent, A',  
Fig. 14, pivoted to a suitable lug, B', and  
adapted to be operated normally by gravity  
to engage any one of the notches or recesses  
C' in the lock-sheave D'. In order to dis-  
engage the detent A', a double cam, A'', is  
provided upon the adjacent sliding stop,  
adapted to slide under the weighted end of  
the detent and raise it so that the catch  
upon the opposite end will be disengaged.

As there is provided a mechanism for au-  
tomatically preventing the over-travel of the  
bridge upon the longitudinal tracks, so there  
is likewise a mechanism provided for pre-

The special advantages of these cranes may  
be briefly described as follows:

1. The propulsion by the fixed cable  
system, which has two functions, namely, to  
serve as a means of pulling the bridge in  
either direction, and as a means of squaring  
the same to its tracks, the crossed cables  
acting as a kind of parallel motion. This  
method of propulsion takes the place of  
transmission shafts, which latter inevitably  
involve the element of torsion, an element  
as vexatious as it is variable with the dis-  
tance from the point of application of power  
and the amount of load.

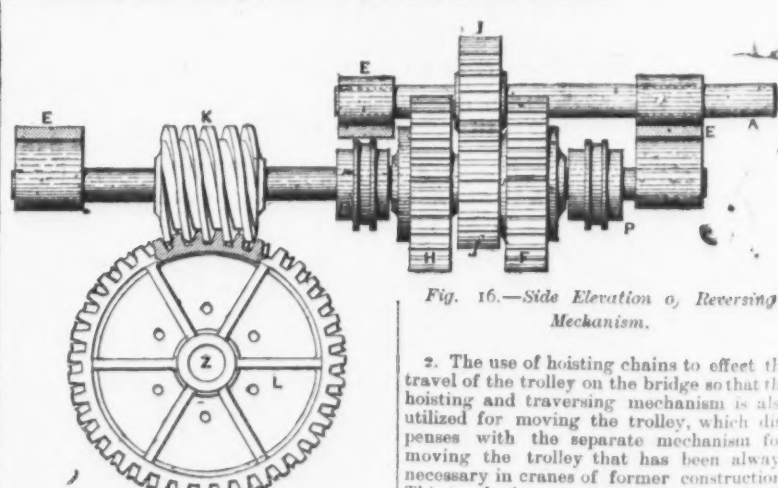


Fig. 16.—Side Elevation of Reversing Mechanism.

2. The use of hoisting chains to effect the  
travel of the trolley on the bridge so that the  
hoisting and traversing mechanism is also  
utilized for moving the trolley, which dis-  
penses with the separate mechanism for  
moving the trolley that has been always  
necessary in cranes of former construction.  
This results in a great simplification of the  
machine and convenience, because the op-  
erator effects all the motions with two levers.

3. The ability to increase the speed of  
hoisting and lowering at any time with the  
load suspended and the crane in motion.

4. The use of a single endless chain operated  
by the independent chain-wheels, the action  
being such that the entire length of the  
chain is gradually passed through the me-  
chanism, so that the wear is distributed  
equally over every link of the chain, in-  
stead of being confined to the use of winding  
drums, as in the old cranes, in which case  
certain parts of the chain wore rapidly,  
while others were but little used.

5. All the motions are obtained by friction  
clutches which, while permitting slipping to  
occur in starting from a position of rest,  
enable a positive engagement to be effected  
at will, so that the several shafts are posi-  
tively revolved by spur-gearing, whereas in  
the old cranes these motions were obtained  
by frictional contact of small sheaves pressed  
against the driving rope, with which con-  
struction more or less constant slipping was  
unavoidable.

6. The operation of powerful clutches  
with entire freedom from collar friction, and



## Cutlery.

## JOHN WILSON'S CELEBRATED

NO ARTICLE MARKED "WILSON" IS GENUINE, UNLESS IT ALSO BEARS THE

TRADE MARK



"FOUR PEPPERCORNS AND A DIAMOND!"

GRANTED A.D. 1786 BY THE CORPORATION OF CUTLERS OF SHEFFIELD, AND PROTECTED BY ACT OF PARLIAMENT.

REGISTERED ALSO AT WASHINGTON, U.S. ACCORDING TO ACT OF CONGRESS.

ALSO AT LEIPZIG, IN ACCORDANCE WITH THE GERMAN TRADE MARKS' REGISTRATION ACT.

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

## DAME, STODDARD &amp; KENDALL,

SUCCESSORS TO

## BRADFORD &amp; ANTHONY,

374 Washington St., - - BOSTON.

Manufacturers, Importers and Dealers in

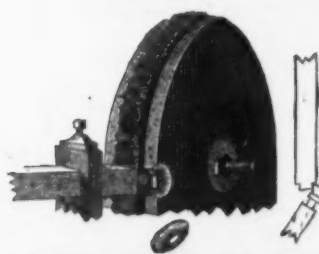
CUTLERY,

FISHING TACKLE,

SKATES AND

FANCY HARDWARE.

SOMETHING NEW.



## J. R. TORREY,

Worcester, Mass.,

AGENT FOR THE

## BENNETT EMERY WHEEL TURNING TOOL.

Guaranteed the most perfect tool, not excepting the diamond, for quickly turning or shaping any sized emery wheel. Price \$3. Discount to the trade. Satisfaction guaranteed or money refunded. Send for circular.

## SPENCER &amp; UNDERHILL,

94 Chambers Street, NEW YORK,

AGENTS FOR

American Screw Co.'s Wood Machine and Rail Screws, Stove and Tire Bolts, Rivets, &amp;c.

G. F. Warner &amp; Co.'s Carriage Clamps.

DEPOT FOR

O. Ames &amp; Son's Shovels, Spades and Scoops.

A. Field &amp; Son's Tacks, Brads, Nails, &amp;c.

Nicholson File Co.'s Files and Rasps.

W. &amp; S. Butcher's Chisels, Gouges, Plane Irons and Cleavers.

E. W. Gilmore &amp; Co.'s Strap and T Hinges.

Russell Jennings' Auger and Dowel Bits.

Richardson Bros' Saws.

Yerkes &amp; Plumb's Hatchets.

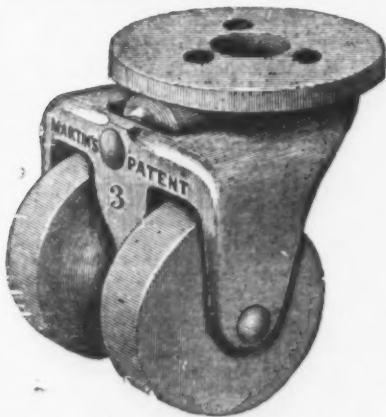
Warner &amp; Noble's Hammers.

ALSO A GENERAL ASSORTMENT OF HARDWARE.

Office of

## PHOENIX CASTER CO.,

Indianapolis, Ind.



Hibbard, Spencer & Co., Chicago, have sold our Casters as follows:

1879.....	\$322.60
1880.....	590.92
1881.....	1371.26
Melson, Matter & Co., Grand Rapids, Mich.:	
1879.....	\$64.60
1880.....	240.00
1881.....	574.51

We have just issued a new Catalogue, which we would be pleased to mail with terms upon application.

## PHOENIX CASTER CO.,

Manufacturers, INDIANAPOLIS, IND.



Our drawers are so uniform, simple, strong and reliable that they are all competitors from the rest.



WROUGHT IRON ADJUSTABLE

"Forty Daisy Trucks in use. Just what we wanted."

WASHINGTON STAMPING COMPANY.

Washington, Ohio.

TUCKER &amp; DORSEY,

MANUFACTURERS, INDIANAPOLIS, IND.

## Cutlery.

CORPORATE MARK,



## Joseph Rodgers &amp; Sons' (LIMITED)

## CELEBRATED CUTLERY,

No. 53 Chambers Street, New York.

F. &amp; W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' pronouncements having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

ESTABLISHED 1836.

## ALFRED FIELD &amp; CO.,

93 Chambers and 75 Reade Streets,

NEW YORK,

SOLE AGENTS FOR

Ely Bros., Caps, Wads, &c.,  
Joseph Elliot & Sons, Razors,  
Isaac Greaves, Sheep Shears, &c.,  
Robert Sorby & Sons, Sheep Shears, &c.,  
Edward Elwell, Hoes, &c.,  
R. & J. Linacre, Grass Hooks and Sickles,  
Webster & Horsfall, Steel Wire,  
GENERAL AGENTS,

(Western File Co.'s American Files.

HEADQUARTERS FOR

ANVILS, CHAIN, CUTLERY, GUNS, &amp;c. &amp;c., &amp;c.

THREE PRIZE MEDALS.



PARIS, 1855. PARIS, 1875.

## MATTHIAS SPENCER &amp; SONS,

Albion Steel Works, Sheffield,

MANUFACTURERS OF

## FILES AND STEEL,

Table Knives, Razors, Shovels, &c., &c., of every description.

CORPORATE MARK.

SPENCER SHEFFIELD

Granted 1749.

## A. F. BANNISTER &amp; CO.

SUCCESSORS TO

FURNESS, BANNISTER &amp; CO.,

MANUFACTURERS OF

## TABLE CUTLERY,

Cor. Nassau &amp; Sheffield Sts., NEWARK, N. J.

## GEO. H. CREED,

## SHIP CHANDLERY,

103 Reade Street, New York.

Manufacturers of and Wholesale Dealers in

Cotton and "Long Flax" Sail Duck,

Cotton and Linen Ravens,

Creed's Patent Ship's Clews. Heltman's Wire Rope Splicers. Agent for Raymond's American Crane Oil for Lubricating Engines and Valves.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

## Cutlery.

Established 35 years.

## J. WISS &amp; SONS,

Manufacturers of the best



## PRUNING SHEARS IN THE WORLD.

SHEARS &amp; SCISSORS,

Japanned and Nickel Plated.



26 Bank St., Newark, N. J.

Send for Illustrated Catalogue and Prices.

## PATENTED ARTICLES

## MALLEABLE IRON.

Hammer's Adjustable Clamps.



Hammer's Malleable Iron Oilers, 3 Sizes  
Hammer's Mail Iron Hand Lamps  
Hammer's M. I. Hanging  
pattern Heavy Screw Clamps;  
strongest in the market.

For sale by all the principal Hardware dealers.

Send for Price List.

## Malleable Iron Castings

Of superior quality and Hardware Specialties in Malleable Iron made to order.

## HAMMER &amp; CO.,

BRANFORD, CONN.

DAVID HYMES, Agent,

4 MURRAY ST., New York.

## VULCAN TOOL CO.,

MANUFACTURERS OF

Bell Hangers', Telephone and Chair-makers' Bits.

Agent for PHOENIX LOCK WORKS, Locks and Keys; PHOENIX GUN IMPLEMENT CO.; PARAGON LOCK WORKS, Jail Locks; FALLS CITY CO., Wood Turning, all kinds; BRIGHTON FOUNDRY, Soft, Gray and Malleable Castings; L. J. GAYLORD, Gimlet and Bung Bore; U. S. TOOL CO., Screw Drivers, Acme Can Openers and Handles.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

Established in 1839.

## A. G. COES &amp; CO.

WORCESTER,

MASS.

Successors to

L. &amp; A. G. Coes,

Manufacturers of

THE GENUINE

COES

## Screw Wrenches.

PATENTED,

May 2, 1871.

December 26, 1871.

December 28, 1875.

August 1, 1876.

The backstrain when the wrench is used is borne by the bar—not by the handle.  
The strongest Wrench made, and the only successful Re-enforced Bar.  
None genuine unless stamped

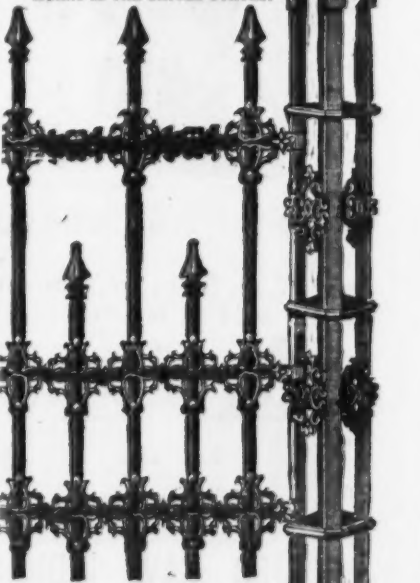
## A. G. COES &amp; CO.

Our Agents, GRAHAM & HAINES, 113 Chamber St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

## CHAMPION IRON FENCE

KENTON, CO. OHIO.

THE MOST EXTENSIVE RAILING WORKS IN THE UNITED STATES.



Received HIGHEST AWARDS at Centennial, Cincinnati, Pittsburgh, Chicago, St. Louis, Kansas City and Atlanta Expositions. Diplomas at Detroit, Toronto, Canada; Springfield, Ill., and other State Fairs.

ALSO MANUFACTURE THE CELEBRATED

## OHIO CHAMPION FORCE PUMP

BEST PUMP MADE!

Located at Kenton, to avoid City expenses.

Send for Illustrated Catalogue (75 pages)

## THE WIRE GOODS CO.,

Worcester, Mass.,

MANUFACTURERS OF

SHARP GIMLET POINTED

WIRE GOODS.

WIRE BENDING A SPECIALTY.

Wire Straightened and Cut to Length.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.

KELSEY &amp; CO., MERIDEN, CONN.



# HALL & ELTON'S GERMAN SILVER.



In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO., Wallingford, Conn., and 47 East 13th St., New York.

## HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

## Finest Quality Silver-Plated Spoons, Forks, Knives, &c.



NOTICE.—We guarantee the base of our Spoons, Forks, &c., to be full 13 per cent. Nickel Silver, and extra heavily plated with pure Silver. Our goods are all hand burnished, and are first-class in every respect. We pack our Spoons and Forks one dozen in each box.

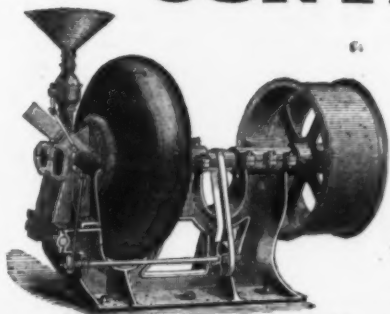
49 CHAMBERS ST.,  
NEW YORK.

Factories,  
WATERBURY, CONN.

18 FEDERAL ST.,  
BOSTON.

## CONTINENTAL WORKS,

BROOKLYN, N. Y.



DU'S Mechanical **ATOMIZER** Or Pulverizer.  
For reducing to an impalpable powder all kinds of hard and brittle substances, such as QUARTZ, EMERY, CORUNDUM, GOLD AND SILVER ORES, BARYTES, COAL, OCHRE, MANGANESE, IRON ORES.

PHOSPHATE ROCK, &c.

It is simple and not liable to get out of order. Revolving Shell being constructed of Siemens-Martin steel, and all parts mechanical in design and of first-class construction. Weight, 5,500 lbs.; heaviest piece, 1,500 lbs. It will pulverize 7 to 10 TONS IN 10 HOURS with 30 H. P.

For Circulars and full particulars, apply to or address

THOS. F. ROWLAND, Sole Manufr, Brooklyn, N. Y.

PREPARED

BILLINGS, TAYLOR & CO.,

CLEVELAND, OHIO,

HOUSE PAINTS

Color Makers, Varnish Makers,

AND

PAINT MANUFACTURERS.

READY FOR USE.

Send for Sample Card and Catalogue.

ENTERPRISE MANUFACTURING CO.

ALKER & CROMLISH,

Iron and Steel Forgings.

Light Machinery Forgings a Specialty.

Estimates furnished, and all work executed promptly at the most reasonable rates.

Nos. 215 & 217 Main Street,  
ALLEGHENY, PA.

# THE YALE LOCK MFG. CO.,

MANUFACTURERS, ENGINEERS AND MACHINISTS.

HENRY R. TOWNE, President.

## YALE AND STANDARD LOCKS,

PLAIN AND ORNAMENTAL BRONZE HARDWARE.

Time Locks,

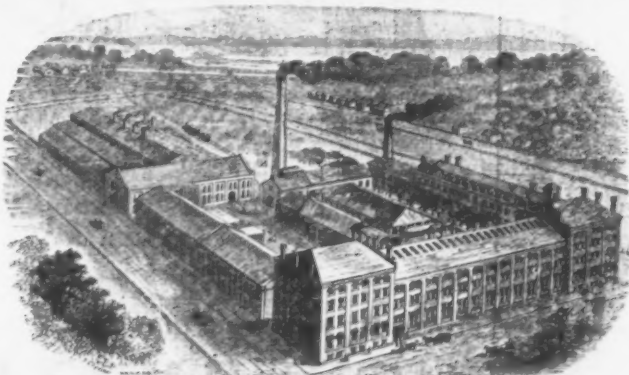
Dial Locks,

Padlocks,

Safe Deposit

AND

Prison Locks.



Weston's

Differential

Pulley Blocks,

Hoists, Crabs

AND

Winches.

## JIB, PILLAR, TRAVELING AND SPECIAL CRANES.

PRINCIPAL OFFICE AND WORKS, STAMFORD, CONN.

SALESROOMS:

NEW YORK, 53 Chambers Street,  
BOSTON, 224 Franklin Street,

PHILADELPHIA, 507 Market Street,  
CHICAGO, 64 Lake Street.

Special Catalogues Furnished on Application.

a system of clutches of great durability, in which the only wear is taken upon the thin disks of sheet metal that are cheaply and easily replaced.

We are greatly indebted to Mr. Henry R. Towne, the president of the Yale Lock Manufacturing Company, for his courtesy in affording us every facility in the inspection of the works, and in obtaining information concerning the details of the construction of these cranes.

### LATEST LEGAL DECISIONS.

#### CHATTEL MORTGAGE.

The mortgagee under a chattel mortgage after the debt to him became due went upon the premises of the mortgagor and took away the mortgaged property in a peaceable manner. An action of trespass was brought against him, and the trial court charged the jury that the failure to pay the debt did not confer upon the mortgagee the right to take possession of the property against the will or without the consent of the mortgagor, and a verdict was found for the mortgagor. The case—Street vs. Sinclair—was carried to the Supreme Court of Alabama, which decided in favor of the mortgagee. Judge Somerville, in the opinion, said: "After the failure of the mortgagor to pay the debt the mortgagee had the right to take possession of the mortgaged property, and he could enter upon the premises of the mortgagor for the purpose of taking possession, and seize the property if he could do this without force or violence. Subject to this limitation, the owner of personal property, wrongfully withheld from him, may have redress by his own act, without resorting to the delay of litigation. But he proceeds at his own peril if he commits the slightest breach of the public peace; for if individuals were thus allowed to redress their own private injuries, the peace of society and good order of government would cease."

#### TAKING WATER-COURSE FOR PUBLIC USE.

A water company in California took proceedings to condemn the waters of a creek which ran through the lands of a private person, and the right to do this was denied. The water company succeeded in the case—St. Helena Water Co. vs. Forbes—and the land owner appealed to the Supreme Court of California, which affirmed the judgment below. Judge Ross, in the opinion, said: "The only question about which we have any serious doubt is whether the statute authorizes the condemnation of the particular kind of property here sought to be taken. It authorizes the taking of: 1. A fee simple. 2. An easement, when taken for any other use. 3. Entry upon and occupation of land to take earth, gravel, stones, trees and timber for public use. The right of the defendant in this stream is not an easement in him; it is annexed and passes as a parcel of his land. He could sell and divert the use of the water to the plaintiff here, and so sell an easement in his land, and this like easement can be taken through proceedings to condemn the right under the statute by virtue of the power of eminent domain."

#### TAKING LAND FOR A PUBLIC USE—TENANTS IN COMMON.

Proceedings were taken in Connecticut to condemn certain land for a public use by town authorities, and one John H. Stevens alone was made the respondent, under the supposition that he was the sole owner. He was, however, one of several tenants in common, and, on this being learned, a second proceeding was taken to condemn the property of the other co-tenants, and the land was duly condemned and taken. The owners then brought actions of trespass, on the ground that, as no tenant in common can make a valid deed to convey the land held in common, no proceeding to condemn land will be effective unless taken against all the co-tenants, but they were defeated, and they carried the case—Stevens vs. Batell—to the Supreme Court of Errors of Connecticut, which affirmed the judgment. Judge Carpenter, in the opinion, said: "With some hesitation we have come to the conclusion that, inasmuch as the proceedings were taken to condemn the land itself, all the rights of Stevens were acquired by the town; the object is to make compensation to the owner and extinguish his title."

#### CORPORATION—AUTHORITY TO MAKE CONTRACT.

A corporation made a joint promissory note and received the full benefit of it, but on being sued for it the defense was set up that, as the corporation had no authority to make the note, it was not bound by it, and the trial court, sustaining this defense, gave the corporation judgment. The plaintiff carried the case—Wright vs. Antwerp Pipe Co.—to the Supreme Court of Pennsylvania, by which the judgment was reversed. Judge Paxson, in the opinion, said: "The defense that a corporation had not the authority to make a contract is never sustained out of regard to the corporation, but only where an imperative public policy requires it. The defendant here has received in exchange for this note full value, which it proposes to retain without paying the note. It would be difficult to imagine a defense with less merit, and the law would be exceedingly impotent were it to allow it to succeed."

#### FIRE INSURANCE—EXPLOSION—TERMINATING POLICY.

In an action for a loss under a fire policy, the insurer set up as his defense that there was an explosion, and that by the terms of the policy it was ended upon the happening of the casualty. The condition of the policy was as follows: "This company shall not be liable by virtue of this policy, or any renewal thereof, for any loss caused by the bursting of a boiler, or by explosion from any cause; and if the premises insured be damaged or destroyed by the bursting of a boiler, or by explosion from any cause, this policy shall be null and void the instant the casualty by explosion occurs." In this case—Waldeck vs. Springfield Fire and Marine Insurance Company—the trial judge decided that the bursting of the boiler, by which the insured buildings and property were damaged, instantly terminated the policy, and hence that the defendant company is not liable thereon for the subsequent loss by fire. The plaintiff appealed to the Supreme Court of

Wisconsin, which affirmed the judgment. Judge Lyon, in the opinion, said: "The plaintiff's counsel asks us to decide that the word 'casualty' means 'fire,' but we do not see how the stipulation could be more plainly expressed than it is in this policy. Indeed, the language is so plain that there is no room for construction. The 'casualty' is the damage from the happening of the explosion, and, in view of the hazardous nature of risks on premises where steam power is used, the stipulation seems to be a very proper one."

### INDUSTRIAL ITEMS.

#### MASSACHUSETTS.

The Williams Manufacturing Company is the firm name of a new stock company organized, with a capital stock of \$200,000, for the manufacture of twist drills, awls, bodkins, &c. All the stockholders of the new company belong in Boston and New Bedford.

The name of the new company which have taken the long unoccupied "file-works" property at Ballardvale, is the Craighead & Kintz Manufacturing Company, and they will make kerosene fixtures, chandeliers and other similar castings in iron, bronze, spelter, &c. Their New York headquarters will be at 33 Barclay street and 38 Park Place, and their Boston store at 52 Pearl street. The company is the outgrowth and reorganization of the Craighead & Elwood Manufacturing Company, of Bridgeport, Conn. The new company includes well-known business men of Boston and Andover, and will give employment at first to 300 hands and eventually to 500.—Boston Commercial Bulletin.

The Holyoke Foundry Company have 50 men employed. A large portion of their work comes from the Deane Steam Pump Company.

#### CONNECTICUT.

The Billings & Spencer Company, Hartford, now manufacture upward of 2000 different articles for parts of guns, pistols, sewing machines, special machinery and machinists' tools, besides manufacturing a large variety of goods in a finished state.

The Yale Lock Manufacturing Company, Stamford, have entered into arrangements under which they intend developing the numerous inventions in scales, gauges and testing machines of Mr. Albert H. Emory, the inventor and designer of the celebrated Government testing machine in the arsenal at Watertown, Mass. They are at present building three 50-ton Emory testing machines.

Work on the new machine shops at Windsor will be started as soon as the charter is obtained.

#### NEW JERSEY.

The Trenton Times of the 10th says: "The heaviest iron ever worked at the rolling mill in this city was rolled there yesterday. It consisted of two 15-inch girders, each weighing 4100 pounds before being charged. Twenty-two men were required to put them in the furnace, and double that number to roll them. The rolling was done by John McLean and the beaters were Thomas Stanton and John Lambert. When taken from the furnace the girders each measured 54 feet long. The engine, with its immense fly-wheel weighing 40 tons, in charge of John A. Logue, was run at 75 revolutions per minute, and rolled the heavy iron with perfect ease. The girders were made for the Yale Lock Mfg. Co., of Stamford, Conn., whither they will be immediately shipped."

#### PENNSYLVANIA.

The Steel Ore Company, of Pottstown, which is composed of Messrs. Gabel, Jones & Gabel, have leased the furnace at Echolsville, Berks county, and changed its name to Norway Furnace. Mr. Griffith Jones, the superintendent, informs us that the furnace was blown in on the 5th of January, and has been doing very well ever since.

There is a prospect that ax-making at Beaver Falls will be resumed before long. On November 9th, Hubbard, Bakewell & Co. closed the ax department of their Beaver Falls establishment, throwing 82 men out of employment. The men are still idle, and as the probability of going back to their old positions have been none too great, they are considering the erection of a co-operative factory. Offers have been received from both Youngstown and Canton, agreeing to furnish the ground and subscribe \$5000 in stock if the men will build a co-operative factory—an idea that is favorably looked upon. A meeting has been held in Beaver Falls to discuss the project, but no action was taken except to appoint a committee to investigate the offers from Youngstown and Canton. The people of Beaver Falls do not want the ax-makers to depart. Many of the men own their homes, and they are valuable residents. The Economic Society looks upon them with a partial eye, and it is thought before allowing them to depart will furnish the necessary aid to put up a co-operative factory at Beaver Falls. It is understood that within ten days Hubbard, Bakewell & Co. will lay a proposition before the men, giving them the choice of working at a reduction of or buying their factory. With the men that point has come when they can no longer remain idle, but must work.

The Reading Iron Works have again put their rolling mill in operation.

Floyd, Wells & Co. is the name of a firm that will take possession of the foundry formerly occupied by the Keeley Stove Company, at Royersford, Montgomery County. They will manufacture stoves, &c., extensively, and expect to start about April 1st. Isaac Brooke, formerly of Pottstown, is a member of the firm.

Orders have been received at the Pennsylvania and Reading machine shops, Reading, for the lathe department to make overtime by working at night for the next two weeks, and the hands are consequently at work every evening until a late hour. This is welcome news to the employees. The shops now present a busy scene, no less than 30 engines being on the stocks undergoing repairs. About 20 more are being built, and



# H. D. SMITH & CO.,

## Plantville, Conn.,

Manufacturers of the

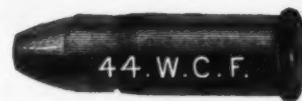
## BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forge Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

## 1000 KENNEDY RIFLES.



### IMPROVED SYSTEM FOR REPEATING RIFLES!

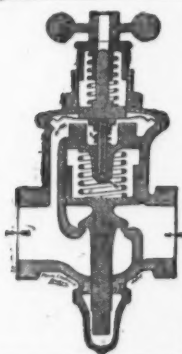
The Manufacturers claim for the "Kennedy" great superiority over all other magazine arms, and the increasing demand is met by largely increased production. The solid metal in line of fire at time of discharge protects the shooter against all accidents. The .44 cal. rifles use "73 Model" cartridges, 40 grains powder, 200 grains lead; and the .45 cal. rifles use "76 Model" cartridges, 60 grains powder and 300 grains lead.

Sporting Rifle, 24 in., Octagon Barrel, 15 shots, .44 cal.,	\$27.00	Sporting Rifle, 28 in., Octagon Barrel, 11 shots, .45 cal.,	\$31.00
Sporting Rifle, 24 in., Round Barrel, 15 shots, .44 cal.,	25.00	Sporting Rifle, 28 in., Round Barrel, 11 shots, .45 cal.,	29.00
Carbine, 20 in., Round Barrel, 12 shots, .44 cal.,	24.00	Carbine, 22 in., Round Barrel, 8 shots, .45 cal.,	27.00

Double Set Triggers, \$5 extra. Extra Length Barrels, \$1 each inch.

## HARTLEY & GRAHAM, 17 and 19 Maiden Lane, New York.

CIRCULARS TO THE TRADE.



### Curtis Pressure Regulator,

FOR STEAM and WATER, is made entirely of metal occupies the same space as a globe valve. It has no glands or packing, and is a lock-up valve. Write for circular. Manufactured by Curtis Regulator Co., 61 Beverly St., Boston, Mass. General Agencies: 100 Liberty St., N. Y.; 135 N. Third St., Phila., Pa.; 8 South St., Baltimore, Md.

### COBB & DREW

Plymouth, Mass.,

Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.

NEW YORK AGENCY,  
**GRUNDY & DISOSWAY,**  
HARDWARE,

165 GREENWICH STREET.

Agents for the Philadelphia Star Carriage and Tire Bolts.



ROMER & CO., Established 1837, Manufacturers of Patent Scandinavian or Jail Locks, Brass Padlocks for railroads and switches, Carriage Lamps and Lanterns, 141 to 145 Railroad Ave., Newark, N. J. Illustrated catalogue sent to the trade on application.

### AXLES

All kinds Wagon & Carriage Axles

Manufactured by the  
**LAMBERTVILLE IRON WORKS,**  
LAMBERTVILLE, N. J. Send for Prices.

### MINERS' CANDLES.

Superior to any other Light for Mining Purposes. Manufactured by

**JAMES BOYD'S SON,**  
Nos. 10 & 12 Franklin St., New York.

## THE BAKER GUNS.

OUR DOUBLE GUN. OUR NEW THREE-  
The Best Gun made  
For DURABILITY &  
Shooting Qualities.



Price, Best English twist barrels, \$45. Damascus Steel, \$60 to \$200.

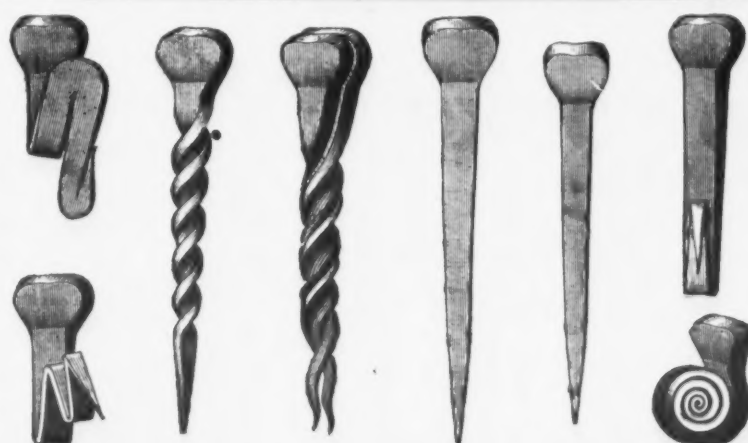
Liberal Discount to the Trade  
SEND FOR DESCRIPTIVE CIRCULAR.

**L. C. SMITH, Maker, Syracuse, N. Y.**



Price, \$75 to \$250.

The gun is light and compact, from 9 to 10 lbs. weight. The rifle is perfectly accurate.



## SARANAC HORSE NAIL CO.,

PLATTSBURGH, N. Y.

S. P. BOWEN, Pres't and Treas.

W. S. GUIBORD, Sec'y.

AGENTS:

ELY & WILLIAMS, Philadelphia and New York.

S. H. & E. Y. MOORE, Chicago.

SLIGO IRON STORE CO., St. Louis.

S. G. B. COOK & CO., Baltimore.

Correspondence Invited.



FISHING TACKLE.

## CONROY & BISSETT,

IMPORTERS AND MANUFACTURERS,

Send for Hardware Trade Fishing Tackle Catalogue. 65 Fulton St., NEW YORK.

FOUNDRIY FACINGS, PLUMBAGO & FOUNDRIY SUPPLIES.

**S. OBERMAYER & CO.,**

Manufacturers of and dealers in all kinds of

**FOUNDRIY FACINGS AND BLACKINGS,**  
**PLUMBAGO AND FOUNDRIY SUPPLIES.**

Capacity of Works, 650 Barrels per day.

HEAVY MACHINERY and FINE STOVE PLATE FACINGS A SPECIALTY.

Send for Catalogue and Price List.

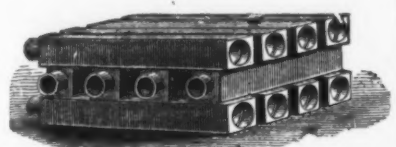
Office and Works, CINCINNATI, OHIO, U. S. A.





**A. WYCKOFF,**

Manufacturer of



**CHAIN PUMP TUBE**

Special prices to the wholesale trade for the next 30 days.

122 Railroad Avenue, **ELMIRA, N. Y.**

**R. COOK & SONS,**

Manufacturers of

**Carriage & Wagon AXLES,**

**WINSTED, CONN.**

ESTABLISHED 1839.

**N. Y. Mallet and Handle Works**



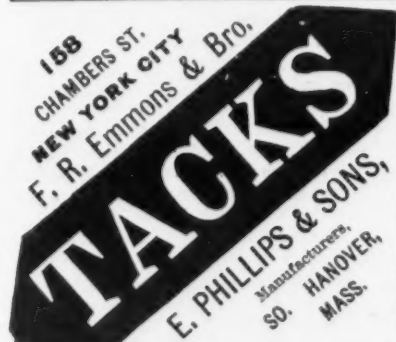
Manufacturers of

**Calkers', Carpenters', Stone Cutters', Tin, Copper and Boiler Makers' MALLETs,**

Hawking Beeties, Hawking and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles. Also

**COTTON AND RALE HOOKS.**

Patented Feb. 13, 1877; a new combination of Hooks. 456 E. Houston St. New York City.



**WALDRON & SPROUT,**

Manufacturers of

**Horse Hay Forks**

And

**Sprout's HAY ELEVATORS, PULLEYS and GRAPPLES.**

Send for Circulars.

Murray, Lycoming Co., Pa.



The Patent Combined

**Dinner Pail and Lantern.**

The most perfect Dinner Pail in the world. Hot coffee for dinner and a Lantern at night.

Manufactured by **JOS. HAIGHT,**

PORT CHESTER, N. Y.

Sent by express on receipt of \$1.00. Agents wanted.

**Keystone Screw Co.,**

17th and Venango Sts., **PHILADELPHIA.**

**J. BILLERBECK,**

Manufacturer of

**Iron Gimlet-Pointed Wood Screws.**

**W. & J. TIEBOUT,**

Manufacturers of

**Brass, Galvanized & Ship**

**Chandlery Hardware,**

No. 16 & 18 Chambers St., New York.

## Vulcanized Rubber Fabrics

ADAPTED TO  
MECHANICAL PURPOSES.

**RUBBER BELTING and PACKING.**

Machine Belting,  
Steam Packing,  
Leading Hose,  
Suction Hose,  
Grain Elevators,  
Steam Hose,  
Piston Rod Packing,  
Gaskets and Rings,



Vacuum Pump Valves,  
Ball Valves,  
Car Springs,  
Wagon Springs,  
Gas Tubing,  
Machine Belting,  
Billiard Cushions,  
Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for the great Elevators of the Panna, and Erie Railroads, of Jersey City and Hoboken, Dow's Stores, of Brooklyn, and many others; in fact, the largest Belts for the largest Elevators in the world.

A single carrier belt in the Panna, R. R. Elevator is over 200 feet long, weighing 15,000 pounds, and has run perfectly from the start.

**LINEN and COTTON HOSE.**



Pat. 544. Plain and Rubber Lined.

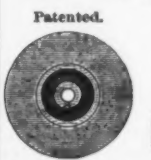
Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c



"TEST" HOSE.

"CABLE" ANTISEPTIC

**Emery Wheels and Packing.**



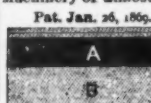
Patented.

**Solid Vulcanite EMERY WHEELS**



Patented.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting grinding, and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small Machinery of almost every description.



Pat. Jan. 26, 1869.

**PATENT ELASTIC Rubber Back Square Packing**

BEST IN THE WORLD.

For Packing the Piston Rods & Valve Stems of Steam Engines & Pumps.

It represents that part of the packing which, when in use, is in contact with the Piston rod. A the elastic back which keeps the part B against the rod with sufficient pressure to be steam tight, and yet creates but little friction.

This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

Pat. Jan. 26, 1869.

**Corrugated Rubber Mats and Matting,**



Pat. July, 1879.

For Halls, Flooring, Stone and Iron Stairways, &c.

This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address

**NEW YORK BELTING & PACKING CO.,**

Warehouse, 29 Park Row, New York.

**JOHN H. CHEEVER, Treasurer.**



**BUCK BROTHERS, Millbury, Mass.**

The most complete assortment in the U. S. of

**Shank, Socket Firmer and Socket Framing Chisels.**

**PLANE IRONS.**

CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark, also "Riverlin Works."

**PHOSPHOR-BRONZE**

FOR  
BEARINGS,  
SLIDE VALVES,  
CYLINDER RINGS,  
CROSS-HEAD GIBBS,  
STEPS,  
BUSHINGS,

And all purposes where Maximum Durability, Anti-Frictional

and Non-Cutting Qualities are Desirable.



TRADE MARKS

**"Phosphor-Bronze."**

CASTINGS OF ALL KINDS TO ORDER.

SEND FOR PAMPHLET AND PRICES.

**THE PHOSPHOR-BRONZE SMELTING CO., LIMITED,**

No. 512 Arch St., **PHILADELPHIA, PA.**

Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor Bronze in

the United States.

the work is being pushed forward as fast as possible. It is stated that all these engines will be needed as soon as they can be finished, on the Reading road and its branches, to accommodate the heavy traffic, and that it is highly probable that the coming season will be a very busy one for the employees of the company.

PITTSBURGH AND VICINITY.

The great 17-ton steam hammer at the Black Diamond Steel Works, of Park Bros. & Co., has revolutionized many features of the iron and steel business in America. Since its erection two years ago it has accomplished many things that before could only be done at Krupp's famous workshops in Germany or at other European establishments. Its latest achievement was made only the other day. There was manufactured by it a large roll for the sheet mill, the ingot weighing about 70 tons. This is said to be the first hammered roll ever made in this country. Heretofore they have been cast. The experiment was a success, and it is presumed that more will be made in the same manner in the future. Something very curious has happened to this immense hammer. Our informant says the anvil block on which the dies rest has sunk down in the earth almost out of sight. It is a monster mass of iron, weighing 160 tons, and to get it out again will require some ingenuity indeed. The accident has not interfered with the operation of the machine at all, as the dies can be adjusted to obviate the difficulty. Although the foundations of the block were laid in concrete, the soil was gravel and other soft earth, having once been the bed of the Allegheny river.—Pittsburgh Post.

Work will be begun about the 1st of March on the new Elba Iron and Bolt Works, on Second avenue, near Elba Station. The iron-work on the new buildings will be a portion of that used in the Main Building at the Centennial Exposition, from which so many Pittsburgh iron works have derived material for building.

VIRGINIA.

According to the Roanoke Review, a corporation known as the Rorer Iron Company has recently been formed at Roanoke, with a capital of \$300,000. The company is said to own some 3000 acres of land, most of which is rich in magnetic iron ore, situated in Cave Spring, district, in the western part of Roanoke County. The company, it is understood, will build a narrow-gauge railroad at once from their mines at Gale, to intersect with the Shenandoah Valley Railroad, in the west end of Roanoke. On the Roanoke River the company will also erect, as early as practicable, a large furnace, which will be on the line of the narrow-gauge railroad, and as soon as the latter is completed the shipment of ore will be commenced.

WEST VIRGINIA.

The Moundsville Rolling Mill, operated by the A. Kloman Steel and Iron Co., is in the hands of the sheriff of Marshall County. The company is composed of W. H. Carruthers, who was formerly engaged in the iron business in Cincinnati, and A. C. and C. H. Kloman, of Pittsburgh. Mr. C. H. Kloman states that the execution against the company on which the levy was made by the sheriff was issued at his own instance. The amount is only \$8600, and while no idea of the assets or liabilities of the firm could be obtained, Mr. Kloman stated that it was not certain that the company would go into liquidation. In any event the Pittsburgh firm will not be affected, as there has been no connection between the two companies. Mr. Kloman declined to say anything concerning the cause of the issuance of the execution, but it is reported that the action is the result of a disagreement among the partners. The company purchased the Moundsville mill property about a year and a half ago, and have since been engaged in the manufacture of merchant iron. The capacity of the mill is about 30 tons per day, and 120 men were employed. These men will be thrown out of employment until the troubles of the company are settled.

OHIO.

The Newark Machine Co. have resumed operations with 128 hands, and will put on 60 to 80 more in the next 30 days. They have put into their shops a large quantity of new and improved machinery and tools, and are now in condition to build 600 Victor clover hullers, 2000 horse grain rakes and 2000 Keller grain drills. They have put into their new shops a new Sturtevant blower, which takes out of the wood shop all the shavings and dust.

The Powell Tool Works, corner of Elm and Washington streets, Cleveland, have been badly damaged by fire. The loss will amount to \$10,000; fully insured.

Machinery for the manufacture of the Zero ice machines has just been put in the Zero Ice Machine Works of Silas Merchant, on the lake shore, just east of Case avenue, Cleveland.

Five-months' orders are in hand by the Lima Machine Works, builders of light locomotives, giving good assurance of steady work for their 125 hands. They were established in 1869.

The Cleveland Co-operative Stove Co. will build extensive additions to their works the present season, giving them increased molding, mounting and storage facilities.

Mr. T. R. Butman, of the Butman Furnace Company, Michigan street, has recently designed a new locomotive fire-box, no arranged that the fireman, by simply pressing his foot upon a short piece which projects through the foot-board, moves a lever beneath and thus unlatches and opens the door. The convenience of this device must be evident at a glance to any one who has watched the efforts required at present to unlatch, open and close the door with each shovel of coal. It is understood that the Lake Shore and C., C. and I. roads are to use it.—Cleveland Trade Review.

The employees of the Cleveland Furnace Company, operating the blast furnace of the Steubenville Coal and Iron Company, had attachments issued last week on their employers for wages due and unpaid. The builders and owners of this furnace had poor success in running it, losing a great deal of money, and the present operators have just concluded making an agreement with large

creditors to settle by accepting partial payments at specified times within the year, at the end of which a settlement in full is to be made. The Cleveland Furnace Company is composed of Cleveland capitalists of good resources, and will pull through all right, no doubt.

The Tiffin Tool Company have lately organized and moved into their fine brick building, donated by the citizens of that enterprising place. The main building is 40 x 120; engine-house, 24 x 28; size of engine, 40-horse-power, built by the Buckeye Engine Company, of Salem. They will employ about 40 hands when under full headway. The specialties are adjustable hoes, rakes, forks and shovels, Diamond scuffle or weeding hoes, goose-neck hoes and Howe's socket mallet, ice-picks and crushers.

ILLINOIS.

The Bergen Tool Company, of Batavia, have recently doubled their capital stock, and have added quite a number of tools to their works.

The affairs of the Union Iron and Steel Company are in the hands of Mr. A. L. Griffin, vice-president of the company, who is acting as receiver in accordance with the orders of the court.

The new wire mill of the Lambert & Bishop Wire Fence Company, of Joliet, will contain large benches of ripping, medium and small-size wire machinery, and an extensive cleaning, bluing and drying plant; also an improved annealing plant. Another department will be devoted to a system of galvanizing based upon entirely new principles. The basement of the building will be occupied by extensive barbed-wire machinery of all descriptions, and to the whole will be added the usual fitting and repairing shops necessary to a large establishment. The plans have been prepared by Mr. G. M. Rose, late of Birmingham, England, who has been appointed superintendent of the works. Mr. Rose has been for the past eighteen years identified with the wire and steel-making business in Europe. He was for several years engineer for the celebrated Dr. C. W. Siemens, of London, and during his connection with him erected several different plants for producing steel for wire. He also put in the Albion steel and wire plant of Sheffield, England, and a portion of Richard Hill & Co.'s wire plant, at Middlesbrough-on-Tees, England.

The Chicago Malleable Iron Company are employing 700 men in their works.

MISSOURI.

The Excelsior Foundry and Plating Company have enlarged their foundry by the addition of another room, 75 x 25 feet, and increased the capacity of their cupola to 100 pounds of running iron per minute. They have also put in a new crane, erected another rolling mill for rolling castings, and have increased their working force about 100 per cent. They are now prepared to make heavy as well as light castings, are busy and full of orders.—Age of Steel.

The Granite Iron Rolling Mills of the St. Louis Stamping Company are running full in every department, and have turned out more galvanized and stamping iron within the last two weeks than at any other equal period in their history.—Age of Steel.

MICHIGAN.

The Martel Furnace is again in blast, running on coal from the new retorts, which are in active operation, as are also the chemical works in connection therewith.—Marquette Mining Journal.

KENTUCKY.

Ashland Furnace made 290 tons of pig last week, working on raw coal alone.

The furnace of the Norton Iron Works is making 70 tons per day. The nail mill was to have started up last Monday.

INDIANA.

Car building seems to be quite active, considering the season. The car works of Indianapolis are at work on a contract for 250 coal cars of 20 tons capacity for the Vandavia line. The Chicago and Northwestern company are building 20 passenger coaches. The Lafayette Car Works, Lafayette, have contracts for 1000 cars for the Rochester and Pittsburgh road, and 2000 for the New York, Chicago and St. Louis Company. For the East River Bridge, New York, 30 cars have been ordered, each 47 feet long, and similar in construction to those employed on the elevated railroads.

IOWA.

A great bridge is now under construction for the Sioux City and Pacific Railroad, across the Missouri river, 20 miles north of Council Bluffs. The piers are of iron, filled with concrete masonry, and the superstructure is also of iron. The bridge will be 1000 in length, and cost nearly \$1,000,000.

We have received a circular from Mr. E. H. Talbot, secretary of the National Exposition of Railway Appliances, dated at the Grand Pacific Hotel, in Chicago, in which he calls attention to the importance of having a full collection of old articles pertaining to railway building and operation exhibited at the coming Exposition. Although many men now living remember the very beginning of railways in the United States, and can vividly describe the early appliances, yet even in the oldest States it is almost as difficult to come across an example of the primitive work as it would be to find any of the apparatus pertaining to the transportation service of an ancient Roman army. Comparatively little attention has been paid by the older roads to the preservation of specimens of their cars, engines, rails and other apparatus. If we remember rightly, it is only ten years ago that, for want of storage space, one of the earliest cars built by Osgood Bradley, of Worcester, Mass., for one of the New England roads, was destroyed or allowed to go to ruin. An exhibition like that which is to be held at Chicago will do a vast amount of good, by calling attention to the older articles and causing the railroads to rescue from the scrap-heap such articles as may illustrate the state of the art at an early day. We publish elsewhere Mr. Talbot's circular entire.



# The Iron Age

AND

## Metallurgical Review.

New York, Thursday, February 15, 1883.

DAVID WILLIAMS, Publisher and Proprietor.  
JAMES C. BAYLES, Editor.  
JOHN S. KING, Business Manager.

### RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

THE UNITED STATES, BRITISH AMERICA AND SANDWICH ISLANDS.

Weekly Edition ..... \$4.50 a year.  
Issued every Thursday morning.

Semi-Monthly Edition ..... \$2.30 a year.  
Issued the First and Third Thursday of every month.

Monthly Edition ..... \$1.15 a year.  
Issued the First Thursday of every month.

#### TO ALL OTHER COUNTRIES.

PER ANNUM, POSTPAID.

Weekly Edition: \$5.00—£1—25 francs—20 marks—12 florins—6 roubles (coin)—25 lire—20 pesos.

Semi-Monthly Edition: \$2.50—£10—12½ francs—10 marks—5 florins—3 roubles (coin)—12½ lire—10 pesos.

Monthly Edition: \$1.25—£5—6¼ francs—5 marks—3 florins—1½ roubles (coin)—6¼ lire—5 pesos.

#### REMITTANCES.

should be made by draft payable to the order of David Williams, on any banking house in the United States or Europe; or, when a draft cannot be obtained, in postage stamps of any country.

#### NEWSDEALERS OR BOOKSELLERS.

In any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; the International News Company, New York, U. S. A.; and London, England; or the San Francisco News Co., San Francisco, California, U. S. A.

#### RATES OF ADVERTISING.

One square (12 lines, one inch, one insertion), \$2.50; one month, \$7.50; three months, \$15.00; six months, \$25.00; one year, \$45.00; payable in advance.

#### BRITISH AGENCY.

Office of the IRONMONGER, 44 Cannon St., London.

DAVID WILLIAMS, Publisher, 83 Reade Street, New York.

PITTSBURGH: J. D. WELLS, Manager and Associate Editor, 200 South Fourth Street.

PHILADELPHIA: T. HOSON, Manager, 200 South Fourth Street.

CHICAGO: HENRY SMITH, Manager, 36 & 38 Clark St., cor. Lake.

NEWYORK: 45 West Fourth Street.

HATTANOOGA: Eighth and Market Streets, S. B. LOWE, Manager.

#### SOLE AMERICAN AGENCY FOR

### THE IRONMONGER.

Published at 44 Cannon St., London.

The oldest and leading representative of the British Iron and Hardware Trades.

Subscription, postpaid, \$5.00.

to countries outside of Great Britain, including Monthly Foreign Supplement of one copy of Ironmonger's Diary.

By a mutual clubbing arrangement between the two journals, subscriptions to both will be received by either *The Ironmonger* or *The Iron Age* on the following terms:

THE IRONMONGER and THE IRON AGE, Weekly, in the United States and Canada ..... \$7.50 or £1.10.

In Great Britain and Ireland ..... £5.00 or £1.25.

In other countries ..... £5.00 or £1.25.

THE IRONMONGER, Weekly, and THE IRON AGE, Monthly, in the United States and Canada ..... \$5.75 or £2.25.

In Great Britain and Ireland ..... £3.25 or £1.10.

In other countries ..... £3.25 or £1.10.

#### CONTENTS.

First Page.—The Iron Movement at Cincinnati. Spain's Iron Ore Trade. Recent Improvements in Cranes.

Third Page.—Recent Improvements in Cranes (Continued).

Fifth Page.—Recent Improvements in Cranes (Continued).

Seventh Page.—Recent Improvements in Cranes (Continued).

Ninth Page.—Recent Improvements in Cranes (Continued).

Eleventh Page.—Recent Improvements in Cranes (Continued). Latest Legal Decisions. Industrial Items.

Thirteenth Page.—Industrial Items (Continued).

Fourteenth Page.—The Production of Pig Iron in 1882. The Decline in Lead. The Iron Situation in the West. The Appropriation for Heavy Ordnance. Telegraphic Consolidation. The Prospect of Tariff Legislation. The Nail Situation West.

Fifteenth Page.—The Nail Situation West (Continued). Death of Wm. E. Dodge. Sizes of Materials. The Duty on Iron Ore. Classification of Scrap Iron. Notes from the Shenandoah Valley.

Sixteenth Page.—Washington Letter.

Nineteenth Page.—Washington Letter (Continued). Fluctuations in Price of Tin Plate. Wm. E. Dodge. Conditions in the Center of the Scotch Iron Trade. The Hay State Iron Company.

Twentieth Page.—Trade Report.—British Iron and Metal Markets. Financial. General Hardware.

Twenty-second Page.—General Hardware (Continued). Iron. Metals. Coal. Imports. Exports. Old Metals. Paper Stock, &c. Foreign Trade Movements. Philadelphia.

Twenty-third Page.—Philadelphia (Continued). Pittsburgh. Chicago. Chattanooga. Cleveland. Louisville. St. Louis. Baltimore. Richmond.

Twenty-fourth Page.—Our English Letter. Foreign. The Scotch Shipbuilding Trade in 1882.

Twenty-sixth Page.—Sharp Tricks in the Cutlery Trade.

Thirty-first Page.—The Iron Age Directory.

Thirty-fourth Page.—New York Wholesale Prices.

Thirty-fifth Page.—New York Wholesale Prices (Continued).

Thirty-sixth Page.—New York Wholesale Prices (Continued).

Forty-first Page.—Philadelphia and Pittsburgh Hardware and Metal Prices.

Forty-second Page.—Boston Hardware and Metal Prices.

### The Production of Pig Iron in 1882.

The American Iron and Steel Association have, at this early date, completed the collection of the statistics of last year's pig-iron production in the United States. The total quantity turned out by our blast furnaces was 5,178,122 tons of 2000 pounds, or 4,623,323 tons of 2240 pounds. This is over 11 per cent. more than was produced in 1881, in which year 4,641,564 net tons, or 4,144,254 gross tons, were made. The actual increase therefore was 479,569 gross tons. The production of 1881 and 1882, classified according to the fuel used, is shown in the following table:

	1881.	1882.
Fuel	Net tons.	Net tons.
Bituminous	2,268,264	2,418,078
Anthracite	1,734,464	2,042,118
Charcoal	638,838	697,900
Total	4,641,564	5,178,122

The figures here given for the production of 1882 are so large that they furnish ample food for reflection. The total quantity produced is not only larger than that turned out in any previous year, but it is very much larger. It is nearly twice the quantity produced four years ago, and two and a half times the quantity produced six years ago. The bituminous pig iron made in 1882 exceeded the total production of pig iron in the United States in the years 1875, 1876 and 1877. The total of anthracite pig iron made in 1882 was nearly as large as the total pig-iron production of the country in 1876, and was more than the entire production in 1871. The charcoal pig iron made in 1882 was very little less than the entire pig-iron production of the country in 1854. The stock of unsold pig iron in the hands of producers at the close of 1882 was more than twice as large as the stock which they held at the close of 1881, but the total quantity held considerably short of 500,000 tons. The following table shows the quantity held at the two dates referred to, classified according to the fuel used:

	1881.	1882.
Fuel	Net tons.	Net tons.
Bituminous	36,495	137,106
Anthracite	90,351	107,250
Charcoal	84,050	165,230
Total	210,896	409,586

The stock of anthracite pig iron on hand at the close of 1882 was very little larger than that held at the close of 1881, but that of charcoal pig iron was almost twice as large, and that of bituminous pig iron was over four times as large. The stock of neither anthracite nor bituminous pig iron, however, could be deemed important, but that of charcoal pig iron was certainly disproportionately large. The stock of bituminous pig iron in the producers' hands at the close of 1882 was but 6 per cent. of the year's production of that kind of iron, and the stock of anthracite pig iron was only 5 per cent. of the year's make, while of the total quantity of charcoal pig iron made in 1882 nearly 24 per cent. remained unsold in the hands of the producers at the close of the year.

The condition of the furnaces of the United States on the 1st of last January, according to the association's returns, is shown in the following table, compared with their condition on January 1, 1882:

Date.	Completed in blast.	Out of blast.
Jan. 1, 1881.....	417	270
Jan. 1, 1882.....	704	446

The decrease in the past year in the number of completed furnaces is evidently owing to the dropping of several furnaces, which are now regarded as abandoned or which have been torn down. The furnaces in various parts of the country now being erected and of which we have knowledge will soon run the number of completed furnaces over 700 again. It is possible, from the figures we now have in our possession, to approximately ascertain the consumption of pig iron in the United States in 1882. Our imports amounted to about 540,000 gross tons, and the producers of pig iron had 188,300 tons on hand unsold at the beginning of 1882, and these quantities, added to the production of the year, make the total supply of pig iron 5,351,623 tons, from which 383,655 tons, the stock on hand unsold at the close of the year, should be deducted, leaving 4,967,968 gross tons as the probable consumption. The stocks in United States bonded warehouses are so small that they need not be considered. In 1881 the probable consumption was slightly greater, having been 4,982,565 gross tons. The consumption in 1880 was only 3,999,415 gross tons.

#### The Decline in Lead.

The lead market has given, from the very commencement of the year, such evident signs of growing weakness that a retrospective glance at production in the United States in 1882 seems to us of interest. It is now ascertained that production in the various localities has been distributed about as follows: Nevada, Utah, Colorado, Nebraska, Illinois, Pennsylvania and New Jersey, 90,000 tons; California and New York, 6000 tons; Missouri and Kansas, 28,000 tons; together, 124,000 tons of 2240 pounds. During the past few years the increase of production has been so enormous that this rapidly swelling output has been successfully met, and from the highest point which domestic lead commanded in February, 1882, it fell no lower than 4½ cents in November. New York City, Brooklyn and Philadelphia have taken unusually large amounts, due in a great

measure to the activity in the building trade; but all over the country similar causes have been at work. Whether this activity will continue in an equal degree this year is highly problematical; the general impression seems to be that we are on the eve of a slackening of enterprise in this respect; that, though general prosperity may be maintained, we shall witness a process of contraction in many undertakings from an instinctive conservative feeling. Should this more prudent course be adopted by the country at large, it would rather be a subject for congratulation than otherwise, for if we had gone on at the same rate as in 1882 and 1881, and perhaps even capped the climax by a "boom" next October, we might have terminated the current year with a panic. Lead producers, however, are so situated that they require a continued enormous expansion of lead consumption to cope with their colossal output. If this fails them, the difficulty of finding a home market for their entire output, or at least approximately so, will place them under the necessity of exporting at very low figures, as will be seen by the London prices given below, as compared with the years since 1878.

HIGHEST AND LOWEST PRICES OF SOFT PIG.	1878.	1881.	1880.	1879.	1878.
£14. 5/	£15. 5/	£19. 10/	£19. 10/	£19. 10/	£19. 10/
£13. 5/	£14. 5/	£14. 5/	£13. 5/	£14. 5/	£14. 5/

The depreciation abroad, the result of over-production, has now lasted five years, and may become worse should we be compelled to throw large amounts on foreign markets. Yet this is one of the possibilities of the future. Desilverizing out West seems to have been very profitable. The 11 works so engaged last year turned out 100,000 tons of lead of 2240 pounds, besides \$20,000,000 worth of gold and silver, so that, between the base and the precious metals, they actually produced a joint value of something like \$30,000,000. They will certainly not slacken their output, not being dependent on lead alone. If they cannot average the price obtained for the latter last year, they will be resigned to part with it for what it will bring in the readiest market. Accounts from Utah, Colorado and Nevada are most promising as regards a large production this year; they are equally so from Montana, New Mexico and Idaho. From the latter we hear that there are a number of mines of promise in the Wood River district and others. The ores are for the most part galenas, and will therefore tell heavily when smelting operations have once been started and better transportation facilities are afforded.

Although lead speculation for a rise has, from experience gained during the past 30 years, earned the reputation of being a poor and precarious business, it was indulged in repeatedly in 1882, and this artificial bolstering up of the prices stepped in on two or more occasions to effectively support the market when the legitimate demand flagged. This year such a game may prove decidedly dangerous, and the usual operators may shrink from it. Left to itself, lead may sink to a lower level than it did in 1882, and this may stimulate consumption to a greater extent than is generally supposed. The sooner it reaches that level, whatever it may be, the better, and the steadier the prices remain afterward the better it will undoubtedly be for the consumer.

#### The Iron Situation in the West.

As will be seen by our market reports, the situation in the iron trade in the West, so far as prices and demand are concerned, is not at all pleasant for manufacturers to contemplate. Prices are certainly lower than they have been at any time since the panic, while cost of production is higher than it was at the time of low prices prevalent after 1873. Pig, coal, puddling, muck, rolling—in fact, all material and wages are higher. This is undoubtedly due to several causes. In the first place, to a widespread belief that prices will not be higher during the year than those ruling for some weeks past. Whether this belief is well founded or not, there is no doubt that it has had a great influence on trade, and has led purchasers to buy only for immediate wants. As a result, the orders on the books of the mills for future delivery are not nearly so large as is usual at this time of the year, and some mills that always desire to see full order books have not been as conservative as they should in their offers. One of the reasons for the feeling that prices will not advance is found in the circumstances attending the strike of last year, which proved that, notwithstanding so many mills in the West were idle, there was but very little difficulty in getting nearly all the iron that was necessary to supply the demand. This clearly indicated a capacity for an oversupply, and has made buyers disinclined to anticipate their wants, as has been the practice for the past two or three years. But another, and probably more potent, reason is the agitation of the tariff question, and the uncertainty as to what the result will be. The effect of this agitation on the business of the country, and especially on the iron business, has been most disastrous. No one seems to know what to do, and believing in the rule that when one does not know what to do it is better to do nothing, they are placing no orders and making up but little stock. It is possible that when the tariff question is settled—and it is evident that nothing will be done for a year at least—buyers may take heart and begin to manufacture in anticipation of their future sales, but at present there seems to be no relief.

At the same time, however, the country is in a fairly prosperous condition, and a most remarkable thing in connection with it is the small lines of credit that the iron mills are carrying now, as compared with those that they carried not more than three or four years ago. We presume that there is not an iron manufacturer in the country, especially those that have dealt to any extent with manufacturers of agricultural implements, who will not bear witness to this fact. The piles of farmers' notes given as security for large purchases of iron by these implement manufacturers have almost entirely disappeared from the safes of the iron manufacturers. Agricultural implement manufacturers are not taking them, but are getting much prompter cash, and, as a consequence, are able to pay for what they buy. This favorable condition in the farming region seems to extend throughout the whole country; other purchasers of iron pay cash to a much greater extent than formerly, and the indications that can be gathered from this condition are that the purchasing and paying power of the country is still very great.

#### The Appropriation for Heavy Ordnance.

The Senate Select Committee, through their chairman, General Logan, have presented in a report, accompanied by sundry recommendations, the results of their investigations on the subject of heavy ordnance. Considering that this report is almost necessarily simply the echo of the views of the Chief of Ordnance as expressed to the committee, we must say that it does not reflect much credit upon either their sagacity or the scope of technical information possessed by General Béné. Whether the assertion made in the report about the "backward state" of our steel industries, the "lack of adequate plant, knowledge of manufacture and experience," is the outcome solely of General Béné's ignorance, or of the combined ignorance of Béné and Logan, we are unable to state. Suffice it to say that the statement, aside from its impertinence, lacks all foundation in fact. "These embarrassments," the report goes on to say, "will in time disappear under proper encouragement and with an increased experience in the manufacture," and therefore, with a view, we suppose, to "properly encourage" American steel industry, which has only a beggarly \$300,000,000 of capital invested in permanent plant, with single establishments having capacities of output exceeding that of the oldest and largest steel works in Europe, the committee say: "We recommend the making of two steel guns, one 8-inch and one 10-inch—both to be rifle, breech-loading guns." Now let the free traders in Congress do their worst! What need American steel manufacturers care for protection, so long as our steel industries are assured of such munificent Government support as the prospect of an order for two guns!

If the Chief of Ordnance or the committee had taken the trouble to apply for information at the proper source, viz., the steel-makers of the country, they would have learned very soon that neither lack of knowledge nor of experience nor of ample facilities to manufacture gun steel has thus far prevented the production of the material, but simply the notorious incapacity of the Ordnance Department. What manufacturer would be willing to risk the large investment in plant requisite for the successful manufacture of heavy steel guns, so long as the Government, upon the recommendation of the Chief of Ordnance, continues to expend money upon the repetition of artillery experiments which were made 10 and 15 years ago by most European powers, the results of which are known beforehand, and the uselessness of which has been amply demonstrated? The few capable officers in the Ordnance Corps who might have sufficient technical knowledge to frame a proper steel specification are promptly suppressed or shelved whenever their views are not in accordance with the particular hobby to which the Chief of Ordnance for the time being is committed. Before our steel-makers will consent to make steel for the Government they will want the assurance that the Ordnance Bureau know at least what they require. There is no difficulty in meeting the requirements of a properly drawn specification; only the person who draws up the specification must know what steel is and what he wants of the material.

No better illustration of the utter ignorance of the committee about the subject they were legislating upon could be found than this recommendation to make two guns. Who is to pay for the requisite plant for making two guns? If the Government wants steel guns, let the Chief of Ordnance be directed to prepare specifications stating precisely what kind of steel and what kind of gun is required. When that official has once learned what he wants, let the Government adopt the gun so specified as its standard model, and then invite bids from manufacturers under such specifications of a sufficient number of guns to warrant the requisite outlay, and there is no question in our mind that plenty of thoroughly responsible bidders will be found. In the meantime, another \$500,000 is to be squandered in the conversion of 10-inch smooth-bores into 8-inch rifles, which was some time ago unanimously condemned by a competent board of army officers, but seems to be the favorite hobby of the present Chief of Ordnance.

#### Telegraphic Consolidation.

The announcement is made that at a meeting of the Western Union Telegraph Company, held a few days ago, an agreement was entered into, by a formal vote, for a lease of the Mutual Union Company's lines, which is accepted by the public as a virtual consolidation of all interests under a single management. The plan was pre-arranged, and all that remained to do was to take formal action. A three-fifths vote was required and cast in each board. The Western Union is to guarantee the interest on the \$5,000,000 of Mutual Union bonds at 6 per cent., and is to pay 1½ per cent. on its \$10,000,000 of stock for 100 years. Under its mortgage the Mutual Union was to put \$50,000 a year into a sinking fund to redeem its bonds. This provision the Western Union assumes. The interest on the bonds and the dividend of 1½ per cent. on the stock make a rental of \$450,000 a year, while the amount to go into the sinking fund will increase the sum to an even \$500,000. In addition, the Western Union assumes the obligations of the Mutual Union, and agrees to carry out its contracts, including those of newspapers for the use of special wires. Simultaneously, the announcement comes from Mr. Pender, the "Cable King," in London, that the proposed rival Atlantic line has been abandoned, but Mr. John W. Garrett, representing the Baltimore and Ohio Railroad Company, the chief promoter of the enterprise, contradicts the statement. It would thus appear that while the Western Union and its friends here and abroad desire to wipe out all opposition, both on land and ocean lines, they may not be able to accomplish their purpose. Already steps have been initiated in the courts with the design of invalidating, or at least nullifying, the vote of the officers of the respective corporations by which the consolidation was effected. The scheme contemplated by the Western Union would seem to involve the founding of a monster corporation for the transmission of intelligence, against whose power all opposition would be futile and whose ramifications would be world-wide.

#### The Prospect of Tariff Legislation.

It seems to be conceded on all hands that the prospect of tariff legislation at the present session of Congress has entirely disappeared. Both the Senate and House have amended their bills out of all likeness to the Tariff Commission bill, the present bill or the bills presented to the Senate and House by their respective committees. Even the prospect that was held out for the adjustment of the tariff in conference committee seems to be pretty well abandoned, and the indications now are that we shall work under the same tariff for the next few years that has been in operation for more than twenty. We say the next few years, because we do not believe, if the present Congress fails to take any action on the tariff, that the next will take any. At that time the Democratic party will be in power in the House, while the Republicans will have the Senate and the President. The wise heads of the Democrats have been anxious to have some tariff legislation this year, to take the question out of the next Congress, being afraid of the action of that Congress on their political prospects in 1884, and with this fear before their eyes, and the Senate Republican, it is hardly probable that anything can be got through, which means that nothing will be done with the tariff until after the election of 1884.

It is much better that no tariff legislation should be had this year than that anything like the Senate or House bill on iron and steel should be enacted into law. The iron and steel manufacturers of this country have for years been inveighing against the extraordinary Treasury decisions that have been so detrimental to their business, and even free traders have acknowledged that the ground of their complaint was just; yet both House and Senate have in most cases enacted into law these decisions, and not only that, but the Senate has deliberately stricken out of the Commission bill or altered all of the provisions that were designed as a safeguard against the recurrence of such decisions, thus really offering a premium for fraud. The manufacturers much prefer that the present bill should remain, with all its iniquitous decisions, than to have such a bill as they would be now likely to get either from the House or Senate.

#### The Nail Situation West.

The stop of four weeks decided upon by the Western Nail Association at its meeting December 28th, ended on Saturday last. On Thursday, the 8th, a special meeting of the association was held to consider what action should be taken as to the future, at which it was decided to start the factories on Monday, the 12th, and run them for three weeks, or up to and including March 3d, then, beginning March 5th, stop for two weeks longer. In a word, the association seems to have come to a determination to control production so as to keep nails at a fairly remunerative rate.

The Western market seems to be virtually bare of nails; there are none in the hands of consumers, jobbers or at the mills. The probability is that at the close of the stoppage there is hardly a mill in the West that will be able to fairly assort an order of 500 kegs. At the same time, however, there does not seem to be much of a pressure to buy; all buyers, jobbers and consumers are



simply getting nails from time to time for their immediate wants. The heavy orders that are generally placed about this time for the spring trade have not yet been placed, as buyers seem well assured that there will at least be no advance in nails, and that they will probably be able to get during the year, from time to time as they shall want them, all the nails their business or trade will demand. In a word, there is no speculative buying or ordering, but all orders are for immediate consumption. At the same time, it seems very evident that during the coming year the demand for nails will be reasonably large. In the year just past the amount of building was very large, and would have been still larger had it not been for the high prices of labor at the beginning of the year, which stopped many projected enterprises. This year labor promises to be lower than at the beginning of last year, and a great many buildings that were then contemplated, but not constructed, will now be constructed, and others undertaken. The demand for other purposes also promises to be quite large, and with the large immigration in prospect and the good condition of the country, it would be strange if the nail product of the present year were not fully equal to that of the last.

#### Death of Wm. E. Dodge.

The sudden death on Friday morning last, about sunrise, of Wm. E. Dodge, is an occasion of regret and surprise. As yet in the meridian of his usefulness, although in the decline of life, having attained the mature age of 77 years, his presence will be sadly missed. The influence of his well-spent years, however, will long endure. Mr. Dodge had just risen from his bed at his home, No. 225 Madison avenue, this city, and was in the act of dressing when he was suddenly seized by a pain in the region of the heart, and almost immediately expired. The cause is supposed to have been neuralgia of the heart, or some disease nearly allied to it. He was in his office in Cliff street one week ago, for, although retired from business about 10 years, he retained a room, desks, &c., in the office of the old firm. For a few days he had not felt very well, and on Thursday sent word to his clerk that he would not be down. The surviving partners and all who heard the sad intelligence were greatly shocked, and the announcement, "Closed on account of the death of Wm. E. Dodge," was at once posted on the doors. Thus a good man passes away. None survive who can exactly fill his place. Always active in every good work, prominent in many of our leading charities, frequently present on the platforms of our religious, eleemosynary and other public institutions, a generous giver, and ever the friend of the poor and unfortunate, his departure will be sincerely as well as widely lamented.

#### Sizes of Materials.

Questions recently raised by correspondents relative to sizes of sheet iron for tinners' use, bring up some considerations of the general subject of the sizes of material, in which our readers may be interested. While special sizes of some materials have largely superseded sizes arbitrarily fixed, or which were determined by some special requirements that have been outgrown by the progress of manufacture, there still remain in use a great many sizes that are ill-adapted to the requirements of the present day. It would seem that makers of some materials have allowed their productions to get behind the times, from lack of attention to the important consideration of adaptability. It must be evident to any one who gives the subject the least consideration, that the original cost of producing a sheet of tin plate, for example, an inch or two longer and correspondingly narrower than the sizes ordinarily sold in the market, cannot be much above that of the regular sizes, provided the quantity required is sufficient to warrant the change, and that therefore the cost of sizes exactly adapted to certain wants ought not to be much, if any, above that of regular sizes. Such is the power of habit, however, that the old sizes 10 x 14 and 14 x 20 are still used in many places where there is actual loss in cutting. In these cases, at least, the manufacturer cannot be blamed, for if a general demand was made for any special size, it would undoubtedly be heeded. The tendency in certain lines is in the direction of special sizes of tin plates, and it is surprising to know in how many dimensions this important material can be obtained at the present time. The trade in special sizes is likely to increase rather than diminish. In many materials, however, a list of which it is hardly necessary to present here, the dimensions are ill-adapted to the general wants of the trade. It certainly is to the interest of both manufacturers and consumers whenever this is the case to give attention to this question, with a view to economy in consumption.

The inquiry of our correspondents referred particularly to the sizes of sheet iron. One of them asked why iron cannot be made a little longer than the usual dimensions, in order to allow enough for trimming and have the net working surface equal to the nominal dimensions of the sheet. Another correspondent asked why sheet iron cannot be packed in bundles at the mills, cut to the size required for stove-pipe, so that the labor

of cutting the iron and the small waste that occurs would be saved. There may be valuable suggestions contained in both of these inquiries, not only for manufacturers of sheet iron, but also for consumers. A careful consideration of the reasonable wishes of consumers is to the advantage of the manufacturer, and a knowledge of what can be obtained is always of advantage to the consumer. One of these questions may be answered by assuring the inquirer that special dimensions of iron can readily be obtained from almost any of the mills, provided an order is given sufficiently in advance of the needs of consumption to allow it to be made. This indicates a willingness upon the part of manufacturers to meet the wants of consumers, but, we presume, does not go far enough to suit the reader who raised the question. The time that he would be required to wait in order to have his iron made to special size would more than offset the little gain there would be in having the iron of that size. What he had in mind, evidently, was the introduction of new standard sizes of iron specially adapted to certain requirements. There would be advantages attending this if it were feasible. The cost of reducing the sheet iron to size in the mills could be made much less than the corresponding work performed in a small way in the various tinshops of the country. The scrap in a mill has a value, and is where it can be utilized, while with the tinner in many cases it is valueless. There are, however, difficulties in the way of producing stove-pipe iron in this way, some of which may have already suggested themselves to our readers. Unfortunately, there is no such thing as standard sizes of stove-pipe among the manufacturers of that article. A so-called 6-inch pipe in one section of the country may be 5½ inches actual diameter, while in another it may be 6¼ inches. In one place the custom is to rivet the pipe, while in another it is made altogether by grooving. Evidently, there would require to be a very material change in various ways in order to utilize special sizes of iron in this direction.

We shall not attempt to point out specific changes or improvements that are desirable to be made in the sizes of materials. We must necessarily leave the subject with our readers, after calling attention to it in this general manner. Sheet iron costs so little per square foot that there is small incentive to close economy in working it. In the copper industry, however, this subject has received careful attention, and now sheets exactly the size to make given articles can be obtained from every dealer in the country. With galvanized sheet iron still other questions arise, the orders of consumers being largely controlled by the machinery that they employ, and standards being somewhat numerous. One large concern with which we are acquainted buys a single size of iron, and by a peculiar system cuts it in such a manner as to use up the scrap very closely. We refer to the use of iron for cornice moldings. For example, if sheets 30 inches wide are in stock, and the production of a certain molding requires strips 12 inches wide, there would apparently be left a 6-inch strip from each sheet cut that would practically be wasted. Instead of cutting the 30-inch sheet into three pieces—12, 12 and 6 inches respectively—the practice, as we understand it, is to cut off one 12-inch strip, leaving an 18-inch piece, which is put back in stock, with the knowledge that in the ordinary course of business it will soon be required. This general subject opens up many practical questions, and is one inviting the attention of manufacturers of materials consumed in the smaller metal-working industries.

#### The Duty on Iron Ore.

To the Editor of The Iron Age: In your issue of Feb. 8 you quote from a letter by Abram S. Hewitt on the ore question. As usual, Mr. Hewitt attempts to mislead the public as to his interests in the iron trade, by pretending to be principally engaged in mining iron ore and making pig iron, whereas these operations are secondary to his main business of rolling iron and steel and drawing wire at Trenton, N. J. He probably consumes five times as much crude metal as he makes in his blast furnaces in New Jersey. A large proportion of his raw material is scrap iron, every ton of which prevents the consumption of a ton of pig iron. Under such misrepresentations he claims to be a great authority on the necessary duty on iron ore, pretending that he would be benefited by the free importation of ore. In his evidence before the Tariff Commission he says that he does not use any imported ore, so that he must derive advantage from a low price of pig iron, of which he is a large purchaser. He has repeatedly stated that every ton of foreign ore causes the use of a ton of native ore which would not otherwise be used. As there have been about 600,000 tons of ore imported in each of the last two years, if there is any truth in his statement he should be able to show where this importation has increased the consumption of native ore, but has never mentioned an instance. His statement with regard to scrap iron is so absurd as to refute itself.

As to the quantity of Bessemer ore to be obtained in this country, it is only necessary to quote his evidence before the Tariff Commission to show the shortness of his memory. He says: "I am interested in three blast furnaces on Lake Superior, and that region is alone capable of supplying not only this country, but of supplying the whole world with pig iron. It is a mere question of putting capital there." Again, in answer to Commissioner Ambler, as to Iron Mountain ores, he says: "They are good, but they contain silica, and it is more expensive to

flux it out. The Lake Superior are the more desirable ores, but you can make steel from the other. We have on Lake Champlain large deposits, and more is being found every day, and in New Jersey, where we supposed we had none, we are getting out large quantities of Bessemer ore."

JERSEY ORE.

#### Classification of Scrap Iron.

ALBURN, N. Y., Feb. 10, 1883.

To the Editor of The Iron Age.—DEAR SIR: Having read with interest the scrap classification proposed by the Committee of the Iron and Metal Exchange, I would like to make a suggestion. The question of edge tools does not seem to be touched upon in any of the specifications which I have seen, and the custom seems usually to let them go with the No. 1 iron. They certainly are inferior and troublesome stock, and should be graded considerably below No. 1. In round and square iron, also, ¾ inch should be the minimum size for No. 1, as smaller iron is too light for good piling stock. I inclose copy of specifications mostly governing in the mills of our city, of which there are four running exclusively on scrap. Very respectfully,  
"INSPECTOR."

#### SPECIFICATIONS FOR WROUGHT SCRAP IRON.

No. 1 shall consist of any heavy wrought iron, such as horseshoes, blacksmith's scrap, boiler-maker's scrap, heavy rods, bolts, wagon tire, shafting and boiler iron, &c., except as otherwise specified. Boiler and tank iron must be cut into separate sheets and castings cut off or the cost of cutting will be charged to shipper. If castings, &c., have to be cut from the wrought iron, the cost of cutting will be charged to shipper.

No. 2 shall consist of shovels, spades, hoes, rakes, forks, scythes, wire, rods ¼ inch in diameter or less, hoops and band iron, wrought pipe, small punchings, burnt nails, wire rope, boiler flues, trimmings from drop forgings, any clean iron ¼ inch thick or less, and all light iron except as otherwise specified.

The following will be rejected: Anvils, old rails, old stove-pipe, galvanized iron, tinned and coppered iron, malleable and cast iron, steel, locks, iron covered with cement or any similar material, iron of such unusual size or shape as not to be worked by ordinary methods, and any other article not usually considered merchantable iron. Rejected iron will be held a reasonable time subject to the orders of the shipper. Unless by special contract, No. 2 iron will be rejected.

#### Directions for Loading Scrap Iron.

All persons shipping scrap iron to us will confer a favor by observing the following suggestions:

1. The floor of the car should be free from unnecessary dirt, especially when fine scrap is to be shipped.
2. When possible, load the short scrap first; then place the long on top. When thrown in promiscuously the short and long become locked together so that unloading is a slow and vexatious task.
3. Exclude all iron not included in the contract, and thus save us the trouble and ourselves the expense of returning rejected iron.

A little care on these points will be to our mutual advantage.

#### Notes from the Shenandoah Valley.

To the Editor of The Iron Age.—SIR: Having been kindly invited by the Shenandoah Iron, Lumber, Mining and Manufacturing Company to witness the blowing-in of their new furnace, I gladly availed myself of the opportunity to see something of the far-famed Shenandoah Valley, and I have thought that a brief reference to some of the more prominent points during our trip might not prove uninteresting to some of your many readers. Through the courtesy of the Cumberland Valley and Shenandoah Valley Railroad companies, a special car for the accommodation of the invited guests was attached to the train leaving Harrisburg at 11:25 a. m., on Wednesday, January 31—the blowing-in having been arranged to take place on the following day, February 1. At Harrisburg our party consisted of representatives from various iron works from Cincinnati, Pittsburgh, Danville, Harrisburg, Philadelphia and other points East, and as these were constantly being reinforced by others along the line of our route, our special was comfortably filled by the time we arrived at our destination, Milnes Station, on the Shenandoah Valley Railroad. We were met at the depot and cordially welcomed by the Messrs. Milnes, Boyer & Price, of the Shenandoah Iron Company. A short time sufficed to have all the invited guests comfortably located under hospitable roofs, and, after partaking of supper, a pleasant evening was spent in social chat. The next morning found most of our party up quite early—quietly looking around and taking in the situation.

Milnes—so named in honor of the public-spirited general manager of the Iron Company, the Hon. Wm. Milnes, Jr.—is a pretty little town situated immediately on the line of the Shenandoah Valley Railroad, 107 miles south from Hagerstown, in the midst of a rich and highly cultivated farming district, with the Blue Ridge on the east and the Massanutten Mountain on the west, along the foot of which flows the south fork of the Shenandoah River. The town boasts of a large and handsome church, school-house, a large mercantile warehouse, telegraph station, post office, newspaper, and it is an important railroad headquarters. The chief business of the place, however, is, of course, derived from the iron works, which have now been in successful operation for a number of years. These works consist of a charcoal blast furnace, forge and refinery, and a large coke furnace recently built, to see the blowing-in of which was the object of our present visit. The company owns in fee simple 31,483 acres, or about 49 square miles, of mineral, timber and farming lands, situated in the southwestern portion of Page and the northeastern portion of Rockingham counties, about midway in length of the famous valley of the Shenandoah. Of this about 22,500 acres are embraced in what is

known as the Massanutten tract, on a range of mountains of upper silurian rocks running along the middle of the valley for nearly 50 miles, dividing the Shenandoah Valley into two distinct valleys—those of the North and South Forks. On this tract is located the old Catharine Furnace, at present out of blast.

While waiting for other guests from Staunton, Richmond, Roanoke and elsewhere, a brief visit was made to the forge and refinery. The plant consists of one run-out fire with a capacity of 8 tons per day of 12 hours, 7 forge fires with same capacity, and a Ferris & Miles double-acting steam hammer. The product consists of charcoal blooms for boiler plates. The iron from this district has long had an enviable reputation for its great purity, and the following recent analysis of a bloom fully substantiates this claim:

Carbon.....	0.42	Manganese.....	0.03
Silicon.....	0.08	Iron (by difference) 99.872	
Sulphur.....	0.01		
Phosphorus.....	0.04		100.000

Our additional guests having now arrived, we took our special and proceeded over the branch road to visit some of the more important ore developments. The first of these was the Boyer bank, where we found a large force at work developing what promises to be a very fine deposit of brown hematite ore. We next visited the Kimball bank, so named in honor of the energetic and able president of the Shenandoah Valley Railroad. Here we found a double-shaft steam washer in active operation, producing 40 tons of clean ore per day. Our next point was the famous Fox Mountain bank. Every one seemed to be familiar with this bank, and yet few of our party had ever seen it. Space will prevent my doing justice to this remarkable deposit of ore, which, to be appreciated, must be seen. A brief description must therefore suffice. The bank is worked by an open cut on the top of Fox Mountain—a short, low, flat-crested ridge or foot-hill of the Blue Ridge. The present working face of ore is not less than 300 feet wide and 75 to 80 feet deep, with ore still in floor of cut. Tunnels have been driven in the face of the cut for a distance of 75 to 100 yards, still showing good rich ore, and the deposit has been proven in a southwest direction for a considerable distance. It is probably one of the handsomest exhibitions of brown hematite ore in Virginia, and its quality is so well established that nothing need be said on this point. The bank yields about one-third lump ore, which is carried direct to the furnace over the branch road, and the wash-ore material is hauled over a tramway to the washer near the mouth of the open cut and quite close to the old charcoal furnace. The washer is a double shaft 25 feet long, run by steam-power. The present supply of water for washing purposes is obtained from Dry Run, a small stream 1½ miles distant, the water being conveyed in pipes to the washer. The ore material yields one-half ore, and the present capacity of the washer is 80 tons per day of clean ore. The lump ore averages a little over 52 per cent. metallic iron, but it requires fully two tons of the average run of the mine to produce one ton of pig metal. Although the Shenandoah Iron Co. have opened other extensive ore deposits on their property, time did not permit our visiting these. A short walk from the Fox Mountain bank brought us to the old charcoal furnace. This is located on Naked Creek, near the end of the branch road, and some five miles from Milnes Station. The stack is 33 x 8½ feet, with Player hot-blast attachment. The engine is an old pattern, 25 horse-power, with 2½-foot stroke. The capacity of the furnace is 60 tons per week of warm-blast charcoal iron, which is worked up into blooms at the company's forge.

The time had now arrived when we were "due" at the new furnace, and a short ride brought us to the "Gem," as the furnace has been named. Here we found everybody "and their sisters and their cousins and their aunts." People had flocked in from the surrounding country to see the blowing-in, for the event was of more than local importance, this being the pioneer coke furnace along the immediate line of the Shenandoah Valley Railroad. It will not be necessary to give the details of the actual blowing-in, for most of your readers are already familiar with the operation. Suffice it to say that everything that was attempted was successfully accomplished, and it seemed to afford great satisfaction to every one to see the wheels go round. Every part connected with the furnace was critically examined by the knowing ones, and the general verdict was, "You'll do." The dimensions of the furnace, buildings, &c., are as follows: Stack, 70 x 15 feet; bell, 7 feet 6 inches; tuyeres, 6 in number, with 5-inch nozzle, placed 6 feet from bottom of hearth; 9 boilers; upright blowing engine, built by the Sheppard Iron Works, Buffalo, N. Y.; steam cylinder, 42 inches, with 7-foot stroke; blowing cylinder, 100 inches, with 7-foot stroke; diameter of wheel, 24 feet; separate steam pumping and hoisting engines, the latter a Stokes & Parrish; hot ovens, Grove's patterns, with 66 pipes; engine-house, 42 x 27 x 60 feet; cast-house, 62 x 100 x 36 feet, with stone foundations, brick walls and shingle roof; stock-house, 50 x 100 feet, frame. The machine work was built by Cruikshank, Moyer & Co., Danville, and the brick and other work by the company. The estimated capacity of the furnace is 70 to 80 tons per day. The ores used will be the native brown hematites found so abundantly on the company's property. The limestone quarry is conveniently situated within a few hundred yards of the furnace. Coke will be used as a fuel. For the present the supply will be drawn from Connelleville, but as soon as the New River division of the Norfolk and Western Railroad is completed to Pocahontas, it is contemplated using the coke made from Flat Top coal. Those most competent to judge were unanimously of the opinion that a first-class quality of pig metal could be made here at a minimum cost. When the mineral resources of the Shenandoah Valley become better known and appreciated, it will doubtless result in the establishment of numerous such enterprises. The completion of the Shenandoah Valley Railroad through to Roanoke—thereby affording outlets to markets in every direction—will largely be the means of bringing about this much desired result.

After everybody had seen everything about the furnace, our party went in a body to the house of the Hon. Wm. Milnes, Jr., where an elegant dinner was served, to which every one did full justice, for the fresh mountain air had considerably whetted our appetites. A pleasant hour or two were afterward spent socially with our hosts, and then came the hour of retiring, not to our beds, however, but to the special car, for, through the courtesy of the Shenandoah Valley Railroad, we were invited to extend our trip as far as Roanoke, to see the improvements being inaugurated there. Before leaving Milnes, however, every one joined in the hope that the "blow-in" would prove as much of a success as the "blow-out" had been. Our journey South was made during the night, and was altogether uneventful. Roanoke is situated at the terminus of the Shenandoah Valley Railroad, where it joins the Norfolk and Western. It is in the midst of a prosperous and highly-cultivated farming district, and it has many natural advantages for a large manufacturing city. During the past year it has made wonderful progress. In 1881 there were only 58 dwelling-houses, which number has been increased to 268 during 1882. It has already two banks, two newspapers and many other evidences of a progressive town. But it derives its present chief importance from the erection of several large industrial establishments, notably the large coke furnace now being built by the Crozer Steel and Iron Company, and the Roanoke Machine Works. Under the escort of Colonel David Houston, general manager of the Crozer Steel and Iron Company, we visited the blast furnace, located about a mile from the town. The stack is 70 x 16 feet, with three Whitwell fire-brick stoves, each 18 x 70 feet, and an iron draft stack 162 feet high. There are two Woimier blowing engines, each with steam cylinder 42 x 48 inches, and blowing cylinder, each 48 x 84 inches. The engine-house is 42 x 25 feet; casting-house, 138 x 50 x 25 feet, built of brick, with corrugated iron roof; stock-house, 150 x 75 feet. The estimated capacity of the furnace is 100 tons per day. The ores used will be chiefly those from the company's mines near Roanoke. The fuel will be coke from the Flat Top region, as soon as this source of supply becomes available. It is expected that the furnace will be ready to blow in about May 1. The machine work of the furnace is being built by the well-known firm of Witherow & Gordon, Pittsburgh.

In the afternoon we visited the Roanoke Machine Works, Mr. Charles Blackwell, the accomplished superintendent, kindly acting as our escort. The works occupy a point immediately at the junction of the two railroads. They consist of the following buildings: An engine house with stalls for 20 engines, and a turn-table 75 feet in diameter; smith shop, 350 x 72 feet, with 4 steam hammers and one drop hammer of 3000 pounds; machine shop, 381 x 72 feet, and an annex 28 x 19 feet for a stationary engine of 100 horse-power; erecting shop, 516 x 64 feet, fitted for the erection of engines, &c.; foundry, 252 x 72 feet, with 2 cupolas, 3 molding machines, hydraulic cranes and a brass foundry; car-wheels and other castings will be made in this building; freight-car erecting shop, 408 feet in diameter, with central turn-table of 100 feet diameter, and having 20 railway tracks in the building, each capable of holding 2 freight cars; planing mill, 250 x 72 feet, with engine room, &c.; storehouse, 165 x 72 feet, 2 stories, with hydraulic hoists. These buildings, which are all now in the course of erection, will form the nucleus of this establishment. They are all of brick, with iron roofing frames and slate roofs, and will be supplied with a complete outfit of all the most modern appliances, so that only the very best character of work may be turned out. The present water supply for Roanoke is obtained from a spring situated 1½ miles south of the town. The estimated capacity of the spring is about 5,000,000 gallons per day, the water being conveyed to the town in 12-inch pipes. One other point about Roanoke is worthy of special notice, viz., the Hotel Roanoke, which was our headquarters during our brief visit. This hotel, recently built and fitted up with all the modern conveniences, is situated on an elevated ridge a short distance from the depot. Its arrangements are complete in every respect, the cuisine is excellent, and the comforts of the guests are well looked after by the genial manager, Mr. Irvin S. Boas.

I cannot close this letter without mentioning some of the more prominent points of interest along the line of the Shenandoah Valley Railroad. The valley itself is a continuation southward of the Walkill Valley of New York, the Lebanon or Cumberland Valley, of Pennsylvania, and it forms a part of the great inland railway route between New York and New Orleans. During the late war it was the scene of active military operations, the railroad line running through several battle-fields, such as Antietam, Port Republic, &c. At Sharpsburg is the "National Cemetery of Federal Dead," where rest the remains of 5000 Northern soldiers who perished at Antietam. Sheperdstown, on the right bank of the Potomac River, is the oldest town in West Virginia, having been settled in 1734. Twelve miles further South we come to Charlestown, noted as the place where John Brown was tried and executed. Ninety miles south of Hagerstown are the famous caverns of Luray, now attracting so much attention on account of their wonderful beauty and grandeur. These are now lit up by the electric light, and thousands of people visit them every year. The well-known Weyer's Cave is situated in close proximity to the railroad station of that name. From Loch Laird station the town of Lexington is only five miles distant, and it can easily be reached by the branch road of the Richmond and Allegheny Railway. It is the seat of the Virginia Military Institute and of the Washington and Lee University, and here are buried Generals Lee and Stonewall Jackson. The Natural Bridge of Virginia, one of the curiosities of the country, is only two miles distant from Natural Bridge station, with which it has connection by means of a regular stage. It will thus be seen that the Shenandoah Valley offers attractions of no mean order, whether it be to the tourist seeking simply the picturesque and beautiful, or to the capitalist looking out for a profitable investment.

about the furnace, our party went in a body to the house of the Hon. Wm. Milnes, Jr., where an elegant dinner was served, to which every one did full justice, for the fresh mountain air had considerably whetted our appetites. A pleasant hour or two were afterward spent socially with our hosts, and then came the hour of retiring, not to our beds, however, but to the special car, for, through the courtesy of the Shenandoah Valley Railroad, we were invited to extend our trip as far as Roanoke, to see the improvements being inaugurated there. Before leaving Milnes, however, every one joined in the hope that the "blow-in" would prove as much of a success as the "blow-out" had been. Our journey South was made during the night, and was altogether uneventful. Roanoke is situated at the terminus of the Shenandoah Valley Railroad, where it joins the Norfolk and Western. It is in the midst of a prosperous and highly-cultivated farming district, and it has many natural advantages for a large manufacturing city. During the past year it has made wonderful progress. In 1881 there were only 58 dwelling-houses, which number has been increased to 268 during 1882. It has already two banks, two newspapers and many other evidences of a progressive town. But it derives its present chief importance from the erection of several large industrial establishments, notably the large coke furnace now being built by the Crozer Steel and Iron Company, and the Roanoke Machine Works. Under the escort of Colonel David Houston, general manager of the Crozer Steel and Iron Company, we visited the blast furnace, located about a mile from the town. The stack is 70 x 16 feet, with three Whitwell fire-brick stoves, each 18 x 70 feet, and an iron draft stack 162 feet high. There are two Woimier blowing engines, each with steam cylinder 42 x 48 inches, and blowing cylinder, each 48 x 84 inches. The engine-house is 42 x 25 feet; casting-house, 138 x 50 x 25 feet, built of brick, with corrugated iron roof; stock-house, 150 x 75 feet. The estimated capacity of the furnace is 100 tons per day. The ores used will be chiefly those from the company's mines near Roanoke. The fuel will be coke from the Flat Top region, as soon as this source of supply becomes available. It is expected that the furnace will be ready to blow in about May 1. The machine work of the furnace is being built by the well-known firm of Witherow & Gordon, Pittsburgh.

In the afternoon we visited the Roanoke Machine Works, Mr. Charles Blackwell, the accomplished superintendent, kindly acting as our escort. The works occupy a point immediately at the junction of the two railroads. They consist of the following buildings: An engine house with stalls for 20 engines, and a turn-table 75 feet in diameter; smith shop, 350 x 72 feet, with 4 steam hammers and one drop hammer of 3000 pounds; machine shop, 381 x 72 feet, and an annex 28 x 19 feet for a stationary engine of 100 horse-power; erecting shop, 516 x 64 feet, fitted for the erection of engines, &c.; foundry, 252 x 72 feet, with 2 cupolas, 3 molding machines, hydraulic cranes and a brass foundry; car-wheels and other castings will be made in this building; freight-car erecting shop, 408 feet in diameter, with central turn-table of 100 feet diameter, and having 20 railway tracks in the building, each capable of holding 2 freight cars; planing mill, 250 x 72 feet, with engine room, &c.; storehouse, 165 x 72 feet, 2 stories, with hydraulic hoists. These buildings, which are all now in the course of erection, will form the nucleus of this establishment. They are all of brick, with iron roofing frames and slate roofs, and will be supplied with a complete outfit of all the most modern appliances, so that only the very best character of work may be turned out. The present water supply for Roanoke is obtained from a spring situated 1½ miles south of the town. The estimated capacity of the spring is about 5,000,000 gallons per day, the water being conveyed to the town in 12-inch pipes. One other point about Roanoke is worthy of special notice, viz., the Hotel Roanoke, which was our headquarters during our brief visit. This hotel, recently built and fitted up with all the modern conveniences, is situated on an elevated ridge a short distance from the depot. Its arrangements are complete in every respect, the cuisine is excellent, and the comforts of the guests are well looked after by the genial manager, Mr. Irvin S. Boas.

I cannot close this letter without mentioning some of the more prominent points of interest along the line of the Shenandoah Valley Railroad. The valley itself is a continuation southward of the Walkill Valley of New York, the Lebanon or Cumberland Valley, of Pennsylvania, and it forms a part of the great inland railway route between New York and New Orleans. During the late war it was the scene of active military operations, the railroad line running through several battle-fields, such as Antietam, Port Republic, &c. At Sharpsburg is the "National Cemetery of Federal Dead," where rest the remains of 5000 Northern soldiers who perished at Antietam. Sheperdstown, on the right bank of the Potomac River, is the oldest town in West Virginia, having been settled in 1734. Twelve miles further South we come to Charlestown, noted as the place where John Brown was tried and executed. Ninety miles south of Hagerstown are the famous caverns of Luray, now attracting so much attention on account of their wonderful beauty and grandeur. These are now lit up by the electric light, and thousands of people visit them every year. The well-known Weyer's Cave is situated in close proximity to the railroad station of that name. From Loch Laird station the town of Lexington is only five miles distant, and it can easily be reached by the branch road of the Richmond and Allegheny Railway. It is the seat of the Virginia Military Institute and of the Washington and Lee University, and here are buried Generals Lee and Stonewall Jackson. The Natural Bridge of Virginia, one of the curiosities of the country, is only two miles distant from Natural Bridge station, with which it has connection by means of a regular stage. It will thus be seen that the Shenandoah Valley offers attractions of no mean order, whether it be to the tourist seeking simply the picturesque and beautiful, or to the capitalist looking out for a profitable investment.

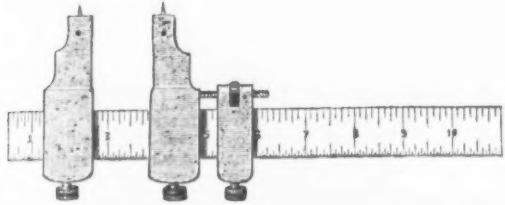
HARRISBURG, PA., Feb. 6, 1883. A. S. McC.



## STANDARD STEEL RULES.



## CALIPER GAUGES.



## COMBINATION PLIERS.

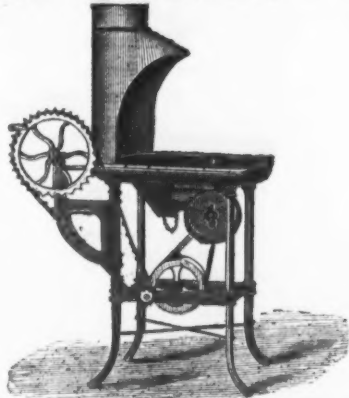


MANUFACTURED BY  
**STANDARD TOOL COMPANY,**  
ATHOL, MASS.

Send for Price List.

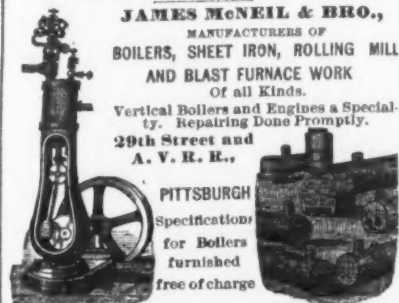
## KEYSTONE PORTABLE FORCE.

Best in the Market. Strong blast and easily worked, durable, and give entire satisfaction. All sizes for every kind of work. Also PRESSURE BLOWERS and EXHAUSTERS. Send for catalogue.



KEYSTONE PORTABLE FORCE CO.,  
204 North Fourth Street Philadelphia, Pa.

## VULCAN BOILER WORKS.



JAMES McNEIL & BRO.,  
MANUFACTURERS OF  
BOILERS, SHEET IRON, ROLLING MILL  
AND BLAST FURNACE WORK  
Of all kinds.  
Vertical Boilers and Engines a Special-  
ty. Repairing Done Promptly.  
29th Street and  
A. V. R. R.,  
PITTSBURGH  
Specifications  
for Boilers  
furnished  
free of charge

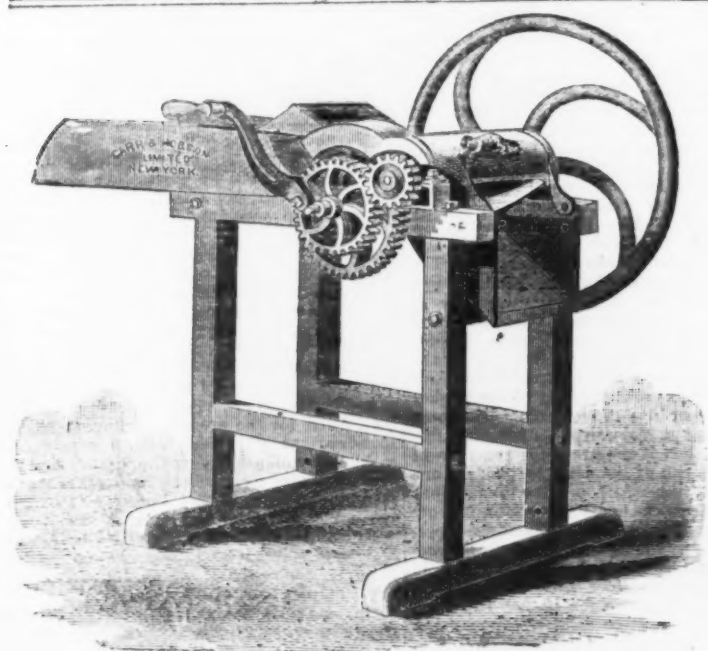
## LIVINGSTON HORSE NAIL CO.,

95 Reade and 113 Chambers Sts., NEW YORK.

AGENTS FOR

GLOBE, EUREKA, BAY STATE,  
PUTNAM, ESSEX, EMPIRE,  
VULCAN, CHAMPION, WESTERN  
**HORSE NAILS.**

NEW LISTS AND DISCOUNTS FURNISHED ON APPLICATION.



# THE TIGER

## BEST OF ALL FEED CUTTERS.

CUTS FASTER,

RUNS LIGHTER,

The Best in Finish, and is the Cheapest.

FOUR SIZES FOR HAND AND FOUR FOR POWER.

\$18 TO \$85.

EXCLUSIVE AGENCIES GIVEN FOR THIS MACHINE.

MANUFACTURED ONLY BY

# CARR & HOBSON, Limited,

Factory, BERGEN POINT, N. J.

47 CLIFF ST., NEW YORK.



**TRENTON LOCK & HARDWARE CO.**  
WORKS  
AND  
PRINCIPAL OFFICE:  
**TRENTON, N. J.**  
AGENCIES AND DEPOTS:  
**JAMES M. VANCE & CO.**  
211 Market St., Philadelphia.  
**JAMES MARSHALL.**  
48 Warren St., N. Y.  
**MANUFACTURERS OF LOCKS AND HARDWARE.**



## CHAMPION ONE-MAN SAW



WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw. We make the following lengths, 3 1/2, 4, 4 1/2, 5 feet. Send for sample.

**WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.**

## THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER

Will roast 30 to 40 lbs at once and can be used as a stove at other times. Send for descriptive list to Manufacturers.

**LANE BROS., Poughkeepsie, N. Y.**

Also sold by leading wholesale houses.

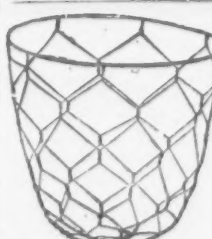
Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.



PATENT PLAIN BACK SOLID CAST STEEL  
**SHOVELS & SPADES**  
OF UNRIVALED QUALITY AND FINISH.  
Sample Orders and Correspondence Solicited.  
**PAYNE PETTEBONE & SON,**  
Works and Main Office, - - - WYOMING, Luzerne Co., PA.

## HEMACITE

ADDRESS  
DIBBLE MFG. COMPANY,  
TRENTON, N. J.  
REGISTERED  
HEMACITE  
DOOR KNOBS,  
DRAWER KNOBS,  
SHUTTER KNOBS,  
HOUSE TRIMMINGS.



Horse or Ox Muzzles

**NATIONAL WIRE AND IRON CO.,**  
DETROIT, MICH.,  
MANUFACTURERS OF  
JAPANNED AND GALVANIZED MUZZLES,  
Sand Riddles, Casting Brushes,  
BRASS, COPPER AND IRON WIRE CLOTH,  
Wire and Iron Work of Every Description.  
SEND FOR ILLUSTRATED CATALOGUE.



# GALLOWAY BOILER

IMPROVED UNDER PATENTS OF 1875 AND 1876.

Safety, Economy in Fuel, Low Cost of Maintenance, Dry Steam without Superheating. Large Reserve Power

ARE THE ADVANTAGES OFFERED BY THIS BOILER IN A PRE-EMINENT DEGREE.

3000 Horse-Power in Progress and for Immediate Delivery. Correspondence Solicited.

EDGE MOOR IRON COMPANY,

SOLE LICENSEE AND MANUFACTURER FOR THE UNITED STATES,

POST OFFICE, WILMINGTON, DELAWARE.

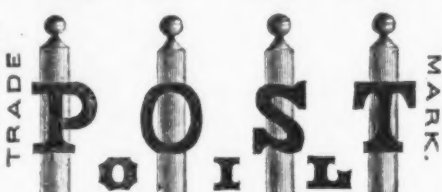
Philadelphia Office, 1600 HAMILTON STREET - - New York Office, 79 LIBERTY STREET.

WM. SELLERS, Pres. JNO. SELLERS, JR., Vice-Pres. ELI GARRETT, Sec. and Treas. GEO. H. SELLERS, Gen. Supt.

## Post's Waterproof Belt Oil and Leather Preservative,

FOR WET OR DRY LEATHER BELTING.

Leather dressed with this oil will not crack or rot, as heat, cold, water or gas has no effect on it. It will spread one-third further and last much longer than any oil for the same purpose. It never turns rancid; it will keep in any climate.



Belts may be run in water at one end, and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue lumps or gum on belts or pulleys, and to keep the surface perfectly smooth.

Registered in the U. S. and Great Britain.

E. L. POST & CO., No. 10 Peck Slip, N. Y.,  
SOLE MANUFACTURERS.

AGENCIES IN THE UNITED STATES:

J. B. Hoyt & Co., New York.	J. Le Roy Pine, Troy, N. Y.	E. B. Preston, Chicago, Ill.
J. & H. Phillips, Pittsburgh, Pa.	Jas. H. Billington & Co., Phila., Pa.	C. E. James, Chattanooga, Tenn.
J. B. Farnum, Woonsocket, R. I.	Brown Bros. & Co., Providence, R. I.	C. B. Choate, East Saginaw, Mich.
G. D. Barr, Buffalo, N. Y.	Davenport Johnson & Co., Atlanta, Ga.	Cameron & Barkley, Charleston, S. C.
E. B. Preston & Co., Minneapolis, Minn.	Sanford & Covel, Fall River, Mass.	Towser, Landstreet & Co., Baltimore, Md.
Post & Co., Cincinnati, O.	J. Ashton & Son, Trenton, N. J.	E. G. Studley, Grand Rapids, Mich.
I. B. Williams & Sons, Dover, N. H.		Mantle & Cowan, Louisville, Ky.
J. B. Hoyt & Co., Chicago, Ill.		

SCOTLAND: Robert Balderston, Glasgow.

## AMERICAN SAW CO.

TRENTON, N. J.

### ALLIGATOR WRENCHES.



TEETH CUT DIAGONALLY.  
Grip with Three Teeth on Round Iron or Pipe.

## THE COLT DISC ENGINE.

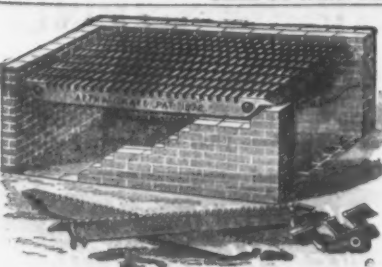


NOISELESS AND ECONOMICAL. BEST PROPELLER ENGINE IN THE WORLD FOR YACHTS, TUGS AND LAUNCHES. ALSO INVALUABLE FOR Dynamo Electric Machines, High Speed Machinery, And Elevator Uses.

WRITE FOR CATALOGUE TO  
COLT'S PAT. FIRE ARMS MANUF'G CO.,  
HARTFORD, CONN.



Our specialty Also, Creosoting, Fencing and Vases, Stable Fixtures, Hitching Posts, Door and Window Guards, Wrought-iron Gratings, Fire Escapes and Ladders, Jails, &c. Our Fencing can be shipped to any part of the United States, and can be set up by the purchaser at small expense. Our prices are reasonable. Correspondence and notice of public lettings of ironwork solicited. Every Hardware Dealer should have our CLEVELAND WROUGHT IRON FENCE WORKS Catalogue. Address  
Office, 31 Water Street, near Union Depot, CLEVELAND, OHIO.

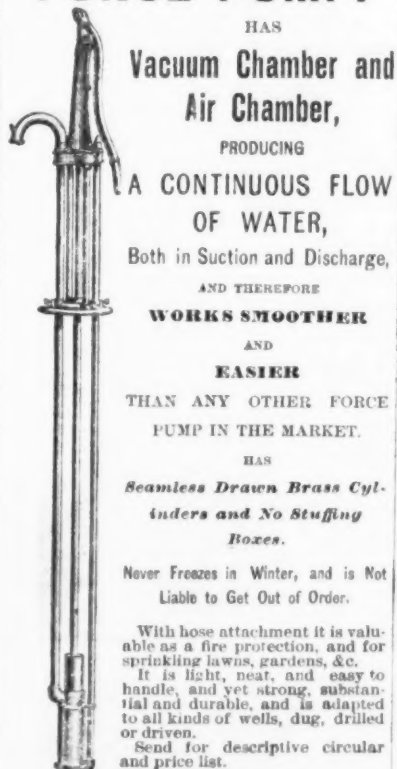


## THE AETNA GRATE.

This is a practical and thoroughly successful SHAKING GRATE BAR. Has been in use over five years, and in many of the largest manufacturing countries. Simple in construction, positive and efficient in its operation, easily worked (being operated in sections in wide furnaces), gives over sixty per cent. Air Surface, very durable, interchangeable, and can be put in any furnace without delay or change of any kind. Descriptive circular, price, &c., sent on application.

AETNA GRATE BAR COMPANY,  
GEORGE H. CLARK, Manager,  
RICHARD THOMPSON, Agent, 110 Liberty St., New York.

## NEW CHAMPION FORCE PUMP.



CLARK BROS.,  
BELMONT, N. Y., U. S. A.,  
SOLE MANUFACTURERS.

## MAST, FOOS & CO.

Springfield, O.

### NEW STYLE BUCKEYE FORCE PUMP.



Works easy, throws a constant stream. Has Porcelain Lined and Brass Cylinders. Is easily set. Is the Cheapest and Best Force Pump in the world for Deep or Shallow Wells. Thousands in use in every part of the United States. Never freezes in winter. Send for CIRCULAR and PRICES, giving depth of well, to  
MAST, FOOS & CO.,  
Springfield, Ohio.

## NEW MAKE OF MINE LAMP.



LEONARD BROS., Scranton, Pa.

## WASHINGTON LETTER.

(From Our Own Correspondent.)

WASHINGTON, D. C., Feb. 14, 1883.

### BRIGHTER PROSPECTS OF THE TARIFF.

There is now little doubt that the Senate will dispose of its tariff amendment by to-morrow or Friday. The question will then be in shape to force to an issue one way or the other. The only apprehension is that some stickler over the prerogatives of the House may claim that the Senate has exceeded its powers in originating a revenue bill. The answer to this is that the tariff feature is simply an amendment to the Internal Revenue bill, a measure which originated in the House, and therefore is not an initial proposition. As soon as the House Internal Revenue bill, including the Senate amendment, reaches the House, an effort will be made to take the bill up, and a motion will doubtless be made to concur in the Senate amendment. This will at once put the question on the point of settlement. Should the House insist on its own bill going through, it would complicate matters seriously. A motion might be made to substitute the Senate amendment for the House bill. This would also force an issue. The easiest way out of the dilemma would be the non-concurrence of the House and the appointment of a conference committee. The House bill might then be temporarily laid aside to await action on the other measure.

### THE PROPOSED CONFERENCE.

Some parties are making a great deal of fuss over the probable formation of the conference committee on the tariff bill. This is entirely unnecessary, as it has always been the custom of either House to select two from the majority and one from the minority. It has also further been customary to make the Senator or Representative in charge of the bill on the floor, the chairman of the respective committees of conference. Now, this being the custom, the chances are that Mr. Morrill, chairman of the Committee on Finance, and Mr. Sherman, Republicans, and Mr. Beck, the Democrat, all of the Senate Committee, will represent the Senate, and Mr. Kelley, chairman of the Committee on Ways and Means, and some other Republican, and Mr. Carlisle, Democrat, will represent the House on their committee. The objection is that the Republicans all favor protection and the Democrats free trade. This may be so, but it is not at all likely that the usages of the two Houses will be set aside on this occasion in order to gratify those who are exerting their best efforts to cripple American industry and reduce labor. The only hope these important elements have of relief lies in the very fact that the conference committee, if the questions be thus referred, will consist of a majority of those in favor of protection.

### APPEALS FROM MANUFACTURERS.

The manufacturers from different parts of the country continue to send in their protests against the ruinous reductions in the rates incorporated in both the pending bills. The universal opinion as to the bills as they now stand is that they would place the iron and steel industries in a worse position than they are now. One of the effects of allowing this question to remain unsettled, they say, will be to slacken orders, and may cause a suspension of operations until something shall have been done to put the trade on a firm basis. Already a number of mills are reported stopped until the question of rates is disposed of. A large body of workmen are also out of employment from this cause. In addition to the circulars sent out by the Amalgamated Iron and Steel Association, a committee will be here in force to watch the course of legislation, and to urge upon Representatives the importance of prompt action, so that active operations may be resumed in the many idle mills throughout the country. But 15 more working days are left of the session. Whatever is done must be done quickly.

### THE FIRST OF THE NATIONS.

During the debate in the House, Judge Kelley showed that the protective policy of the last 20 years had made us the first manufacturing nation of the world, the first transporting nation of the world, although the British flag floated over the ocean to our exclusion, and the greatest mining nation of the world, even not counting gold and silver. Mr. Kelley further remarked that a writer in a recent number of the *St. James's Gazette*, glorifying England's enormous progress during Victoria's reign, tells us that England's production of coal in 1840 was 35,000,000 tons; that 40 years later it was 147,000,000 tons. In 1860 the United States mined 14,063,980 tons of anthracite and bituminous coal, and 20 years later our progress was over 66,375,526. England's increase from 1840 to 1880 was but 420 per cent., while in 20 years between 1860 and 1880, 20 years of high protection, our increase was 472 per cent. In 1840 the British production of pig iron was 1,396,000 tons, and it increased in 40 years to 8,326,000 tons. In 1860 we produced but 821,000 tons, and in 1881, 4,441,000. England's increase in 40 years was 596 per cent. Our increase in one-half the time was 504 per cent.

### THE FREE-TRADE WAGES DODGE.

Mr. Morrison launched out into the free-trade sophistry about wages. He said: "When this question shall have been disposed of I will, if permitted, move to place iron ore on the free list. Taking about \$9,500,000 of wages paid to our 32,000 iron miners, we find that the cost in wages of a ton of ore—in other words, the money paid in wages for the ore at the mine—is \$1.35. It is also true that it will cost double as much to import the ore as is paid in wages for mining it. Hence we have in our natural advantages sufficient protection to labor, even upon the protection theory that the duty must equalize the conditions of labor and capital between us and our competitors, for here we find the advantage with us without any duty."

### CARLISLE ON WAGES.

Mr. Carlisle favored a rate to cover the difference in the cost of labor, allowing nothing for margin for those who risked their capital in such enterprises. He thought that if our furnaces pay \$12 per ton for making pig iron, and our wages are 100 per

cent. higher than wages abroad, the cost of labor in a ton of pig iron abroad is just \$6. "I propose now to vote for a rate of \$6 per ton on pig iron, which is just exactly the difference between the cost of labor here upon a ton of pig iron and the cost of labor abroad, conceding that we pay 100 per cent. more here than there."

### CARLISLE'S LOGIC EXPOSED.

Mr. Miller, of Pennsylvania, exposed Carlisle's ignorance of the question when he pointed out from the figures the actual results of his mode of reasoning. He showed that there were imported into the United States in the fiscal year ending June 30, 1882, 1,486,475 tons of iron and steel. As there is usually 25 per cent. of loss in converting pig iron into finished iron and steel, the equivalent weight in pig iron of the weight of iron and steel above given can easily be estimated. Including the pig iron imported, the total iron and steel importations, so far as the weight is ascertainable, were equivalent in the fiscal year 1882 to 1,750,000 gross tons of pig iron. This large amount is about two-fifths of the entire production of pig iron in the United States in 1882. Continuing, he said: "Assuming the correctness of the estimate made by the gentleman from Kentucky, that \$11.54 per ton is the amount of wages represented in producing a ton of pig iron, which I have demonstrated is entirely too low, then the wages represented in the importation of this amount of pig iron alone amounts to the large sum of \$20,200,000. This amount would employ 33,660 men for 300 days, at an average rate of \$2 per day. Now, to assert in the face of this that our present rates on pig and manufactured iron are prohibitory is absurd. To reduce the duty on pig iron in the face of these facts is a direct blow at our pig-iron industries. Rather than reduce, I insist that this duty should be increased, in order that our present rate of wages may be maintained." The point was well taken, and Mr. Carlisle made some very lame statements in his efforts to limp off the field. His discomfiture was so complete that Tucker, of Virginia, and other free traders rallied to his relief. This was to no purpose, as it was then demonstrated that he had attempted a fraud on the House by only reading such part of a statement as suited his purpose.

### RESISTANCE FROM FREE TRADERS.

The opponents of protection have made a stubborn resistance to the metal schedule at every point. Iron ore, pig, manufactured iron, steel, tin plates, cotton ties, and, indeed, everything as it came along, was the target of assault. The Southern Representatives followed up their tactics by attacking cotton ties and uselessly prolonging the discussion on this perplexing topic.

### PLAIN TALK FROM SOUTHERN SOURCES.

After the Southern members had very freely relieved themselves of their free-trade views, Mr. Moore, a Republican Representative from the Memphis district, Tennessee, paid his compliments to the Representatives from that region in a very emphatic manner. He said: "For nearly two weeks we have been trying to enact a new tariff bill, a bill looking to a general revision of the existing law, a revision urgently demanded by every industrial interest in every part of our common country. In the face of the substantially universal entreaty for action by this House, the majority have been compelled to sit here from day to day and from hour to hour and listen to one continuous and wishy-washy flood of often frivolous, seldom entertaining, never edifying, but sometimes absolutely silly, political slush and Bourbon flip-flop, intended, no matter what the ostensible pretext, to prevent the passage of any tariff measure during the present session."

### A SOUTHERN PETITION.

Mr. Moore then presented a petition from a long list of iron manufacturers of Alabama, and representing the following companies: Coosa Furnace Co., A. J. Crawford, president; Mary Pratt Furnace, De Barleeben & Underwood; Birmingham Rolling Mill Co., James G. Caldwell, president; Round Mountain Iron Works, R. P. Sibley, lessee; Sloss Furnace Co., J. W. Sloss, president; Tecumseh Iron Co., Willard Warner, president; Woodstock Iron Co., George Noble; Clifton Iron Co., George Noble; Edwards Iron Co., Giles Edwards, president; Shelby Iron Co., J. F. Black, superintendent; Alice Furnace Co., T. T. Hillman, president; Bass Furnace Co., H. C. Eagle, manager.

The views of the interests named were submitted in a memorial to the following effect: That we have vital interests in the pending tariff legislation; that our distance from markets for our products neutralizes the advantages we may have of cheaper production; that we need the tariff to secure the American market to American producers; that with English wages we could defy England, but that paying, as we do, double her wages, we cannot compete with her, even in the markets of our own State; that we earnestly urge the passage of a tariff bill this session—not less protective than the Commission bill—and that we shall seriously deprecate any attempt to defeat the will of a majority of Congress by factious opposition; that the whole sum paid as dividends on capital invested in making pig iron in Alabama and Georgia has not amounted to 5 per cent. of the capital sunk and lost in the same business during the past 15 years; that we pointedly dissent from the recently published statement of an official of an Alabama iron company, that iron is being made in Alabama for \$9.50 per ton, as different from our experience with equal facilities by from 30 to 50 per cent., even for the cheaper grades of iron; that it is our opinion, based on 10 years' experience in the manufacture of pig iron in Alabama, that the cost of making it will in the future increase rather than diminish.

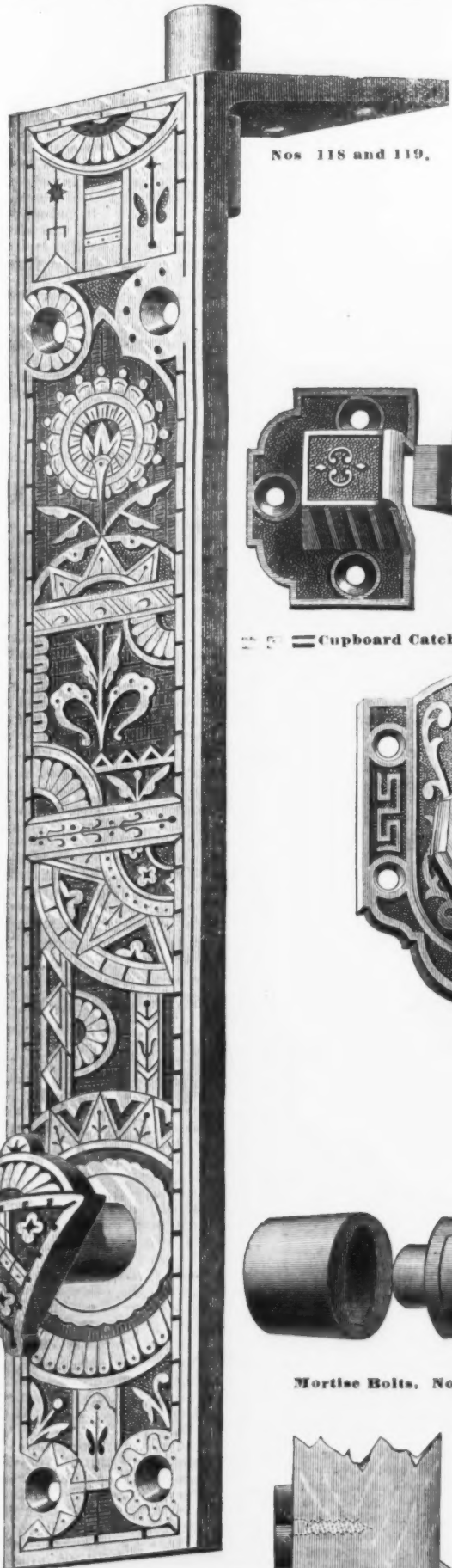
### PROGRESS OF THE DISCUSSION.

The progress of the House on the metal schedule has been slow and tedious, and some important changes have been made. For instance, on boiler or other plate iron, sheared or unsheared, skelp iron, sheet iron, common or black, not thinner than No. 20 wire gauge, the rate was reduced from 1 3/10 to 1 2/10 cents per pound, and on other kinds of the same iron the same proportionate reduction. On tin plates, terns plates and

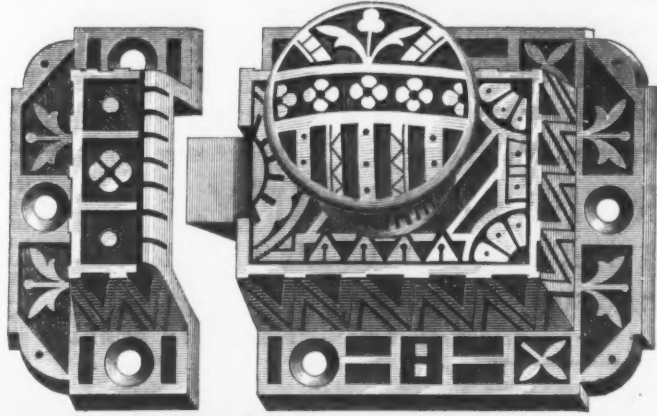
Manufactured by A. F. JACKSON & SON, Milford, N. Y.



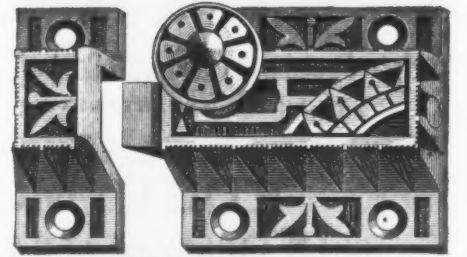
# SARGENT'S HARDWARE



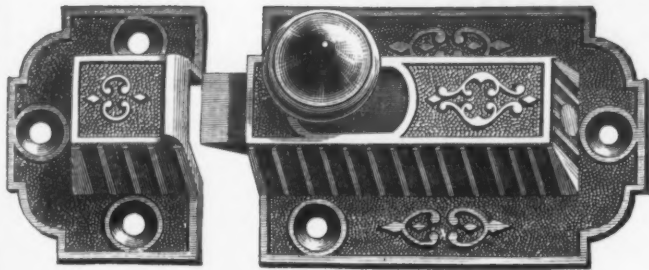
Nos. 118 and 119.



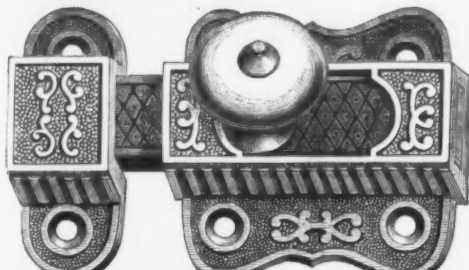
Cupboard Turns. Nos. 4850 and 4950.



French Window Catches. Nos. 3252, 3452, 3852 and 3952.



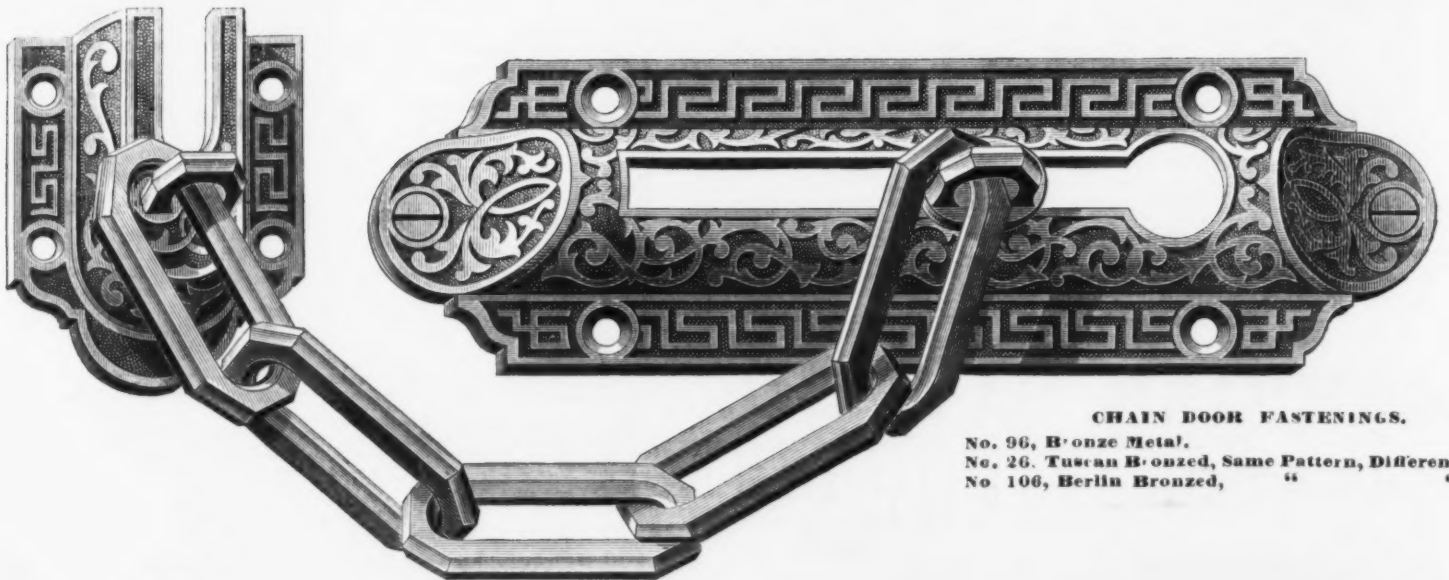
Cupboard Catches. Nos. 272, 472 and 572.



Cupboard Bolts. Nos. 224 and 225.

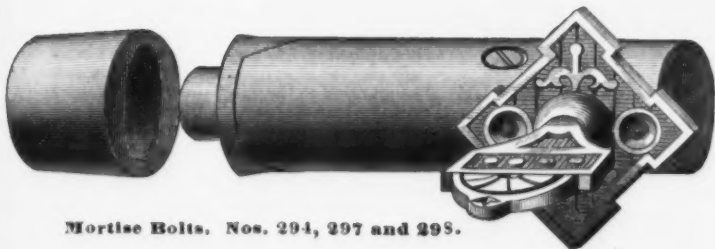


Door Buttons. Nos. 32 and 33.

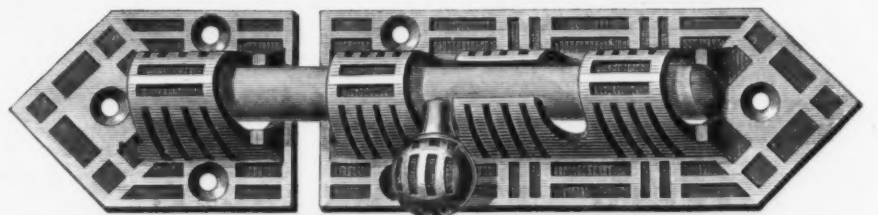


CHAIN DOOR FASTENINGS.

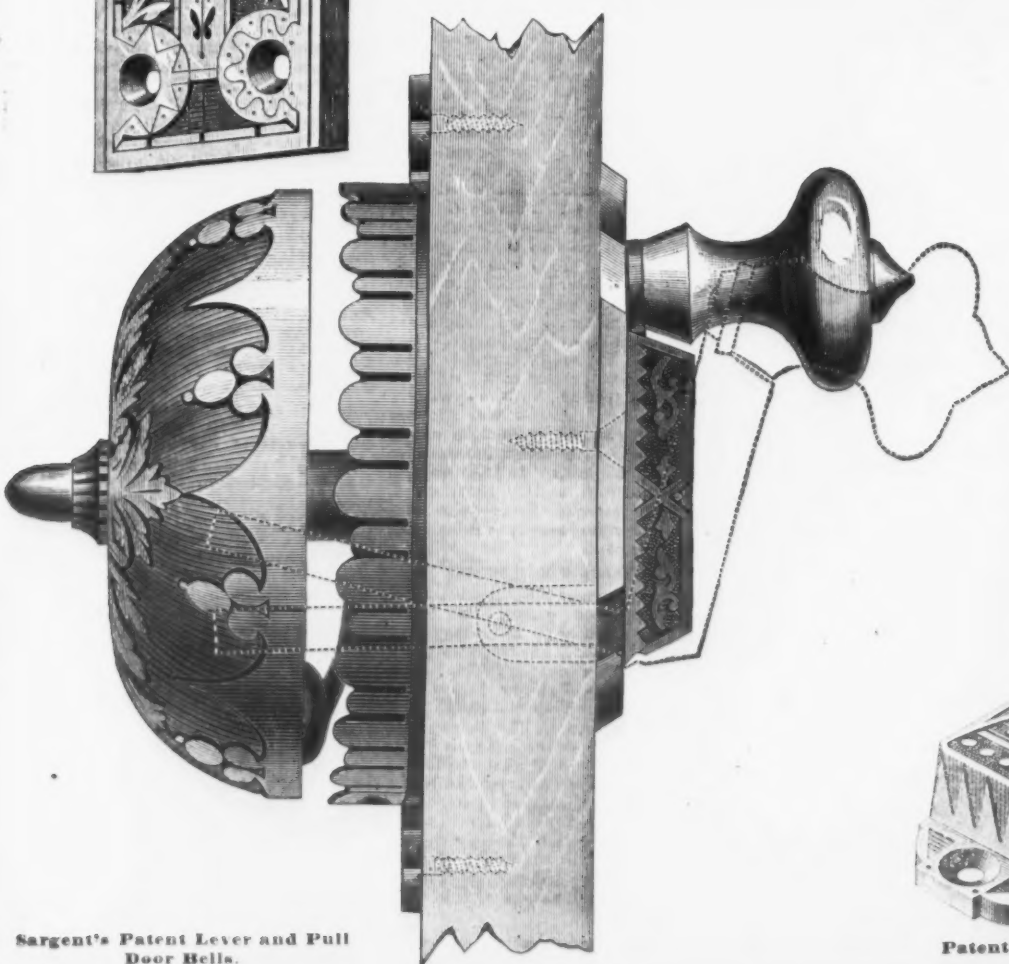
No. 96, Bronze Metal.  
No. 26, Tuscan Bronzed, Same Pattern, Different Chain.  
No. 106, Berlin Bronzed, " "



Mortise Bolts. Nos. 294, 297 and 295.



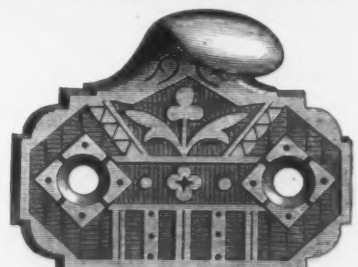
Barrel Bolts. Nos. 261 1-2, 461 1-2, 561 1-2 and 961 1-2.



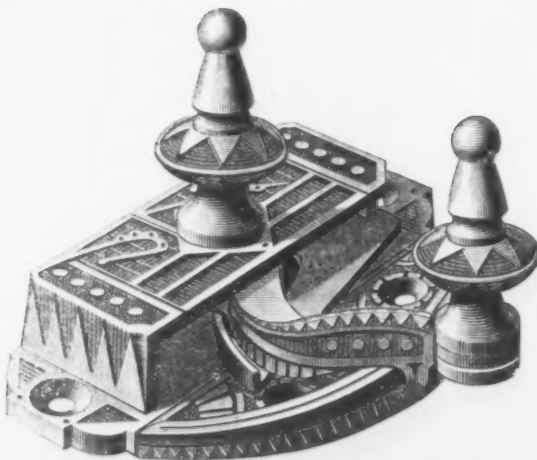
Sargent's Patent Lever and Pull Door Bells.

Shutter Knobs.  
Nos. 84 and 88.

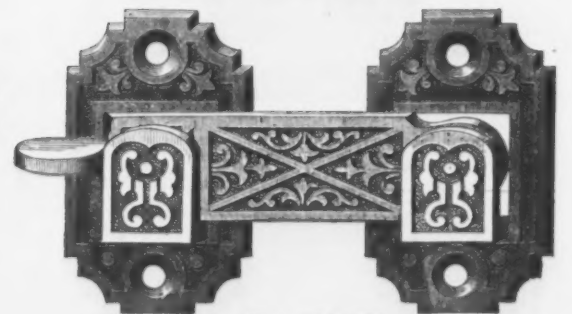
Drawer Pulls. Nos. 501, 505, 506 and 507.



Sash Lifts. Nos. 842 and 942.



Patent Burglar Proof Sash Fastener. No. 578.



Shutter Bars. Nos. 134, 135 and 137.

**SARGENT & Co. HARDWARE MANUFACTURERS.** NEW YORK  
NEW HAVEN, CONN.





## THE "SIMONDS" SAWS,

INCLUDING

CIRCULAR, GANG, MULAY, DRAG AND CROSS-CUT,

Are manufactured under a new system—covered by many patents—which produces a result hitherto unequalled.

## THE "SIMONDS" KNIVES,

INCLUDING

Planer Knives, Paper-Cutting Knives, Shingle, Stave and Jointer Knives, and Every description of Pattern Knives, Are warranted of a superior quality.

Communications or orders for Saws, for Knives, or for Repairing will receive proper attention if addressed to

SIMONDS MANUFACTURING CO., Fitchburg, Mass.,  
Or, Corner Canal and Washington Sts., Chicago, Ill.

## KIESER'S MEAT CUTTERS.



Double,

Shearing Cut

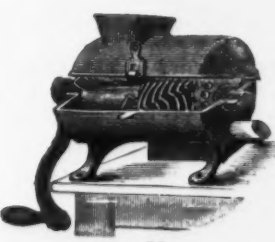
Cast Steel

KNIVES.

Will Thoroughly Cut

BEEF OR PORK.

"Monarch" Cutter and Stuffer.

EASILY WORKED  
AND CLEANED.  
THE ONLY PRACTICAL  
MEAT CUTTER MADE.ALSO THE  
MONARCH CUTTER &  
STUFFER,

Gem.

No. 55. FLY AND GEARED WHEELS FOR BUTCHERS' USE.  
Every Cutter Warranted.

KIMBALL SHOVEL CO., Sole Patentees and Manuf'rs, Baltimore, Md.

## THE PUSEY & JONES COMPANY,

WILMINGTON, DELAWARE,

BUILDERS OF

STEAM ENGINES,

Boilers, Tanks,

MACHINERY FOR ROLL-

ING MILLS,

Punches, Shears,

Machines for Cutting off and  
Slitting old Railroad Rails pre-  
vious to being piled in Rolling  
Mills.

Steam Riveting Machines,

Applicable to Bridge Builders' Work.

RIGHT AND LEFT ANGLE

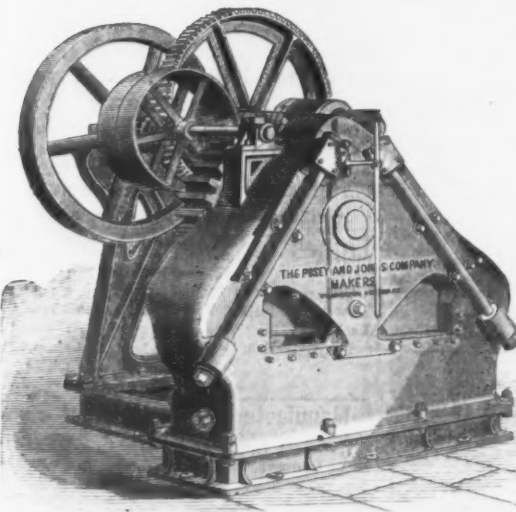
IRON CUTTERS,

Hydraulic Bending

Machines,

AND HEAVY MACHINERY

GENERALLY.



S. CHENEY &amp; SON,

MANLIUS, N. Y.

MANUFACTURERS OF LIGHT AND MEDIUM WEIGHT

## GRAY IRON CASTINGS,

METAL PATTERN MAKERS AND JAPANNERS.

Correspondence solicited.

taggers tin the rate was reduced to 1 cent.  
Hoop, band or scroll iron remained the same.

### THE LABOR QUESTION.

The Senate Committee on Education and Labor, as opportunity offers, are still making their investigation into the causes of strikes and the relations of labor and capital. Representatives of the Knights of Labor have been before them and have very fully covered the causes of complaints among workmen. They very fully presented the different classes of work in iron mills and the wages paid for the same. They claimed that men in iron mills were better paid than those working in coal mines, and then proceeded to demonstrate that such was the fact. The wages of the latter averaged \$350 a year, out of which they were obliged to pay for powder, oil, lamps, &c. They also denounced the "pluck me" store system. In regard to the latter they asserted that the Pennsylvania law prohibiting such stores was inoperative. They complimented the Rochdale system of England, which involved the co-operative plan. There a certain per cent. of the profits was divided quarterly among the patrons of the store not stockholders. There are stores of this kind in the United States which have been very successful. The representatives of this organization said that some legislation should be had to prohibit speculation in the necessities of life. They also asked the application of the eight-hour system of the Government to the workmen in private establishments.

Mr. Blair's committee have accumulated quite an amount of testimony bearing upon the questions of strikes and labor, and will continue to hear responsible parties upon the same subjects. There is no intention, however, to make any report during the present session of Congress. It is believed that the investigation will be considerably extended during the summer adjournment, so as to be able to formulate some kind of a proposition looking to the adjustment of the differences between capital and labor.

### TRADES UNION BILL.

Senator Blair, from the Senate Committee on Education and Labor, has reported a bill granting acts of incorporation to national trades unions. It provides that any organization of the character named, having two or more branches in the States or Territories, shall be entitled to receive from the United States courts charters as national associations, under such name as they may designate. They have the power to sue and may be sued, and are granted certain other powers necessary to the carrying out of the object of their creation. This measure is simply preliminary to more elaborate legislation on the subject of strikes. The Trades Union bill is not regarded as part of the principal investigation of the committee, but is a step toward bringing trades unions under the jurisdiction, regulation and control of some responsible authority.

### THE KENNEDY CASE.

The case of John F. Hartranft, Collector, vs. L. P. Kennedy, trading as Kennedy & Brother, entered on the docket of the Supreme Court of the United States February 3, 1882, still remains untouched. In the regular order of business of the court it cannot be reached in its present place for two years. It was supposed that a request for its advancement on the docket would be made at the opening of the sessions of the court, but, nothing having been said on the subject, it still remains where it stood when first entered. The case is one of duties on hoop iron in cotton ties, and it was presumed that the urgency of the principle involved would cause the Attorney General to make the request for advancement. There is no probability of the case being taken up at this term of the court. It is thought that the case may have been abandoned by the parties, although there is no record of it here.

### THE TESTS OF IRON AND STEEL.

Representative Campbell, chairman of the Committee on Manufactures, says that he has abandoned all expectation of the passage at this session of the bill providing for the creation of a commission to make certain tests of the strength of structural materials, the tariff question having already consumed the major portion of the session, and the paramount importance of the appropriation bills will preclude all possibility of action between this and the 4th day of March. The bill, as is known, was reported favorably and placed on the calendar. On a motion to suspend the rules in order to take it from the calendar, the motion came within a few votes of obtaining the necessary two-thirds. If all the friends of the measure had then been present the bill would have passed. Now it cannot be until the next Congress. General Campbell has been re-elected, and therefore, as a member of the Forty-eighth Congress, will reintroduce the bill and insist upon immediate consideration by the Committee on Manufactures and by the House of Representatives.

### Fluctuations in Price of Tin Plate.

Messrs. H. T. Lockwood & Brother, of this city, have published a chart which covers the history of tin plate prices from 1869 to the close of 1882. Very little change occurred in tin-plate prices from January, 1869, to the fall of 1871. Here, however, ends the even tenor of the course, and precipitous lines begin to describe a mountain peak, the occasion being the sudden rise in prices which occurred in the fall of 1871 and the spring of 1872. The fall of 1872 saw a decline, while the spring of 1873 saw another rise. The autumn of the latter year brought another decline, and then, with varying rises and falls of no special importance, but with a gradual tendency downward, the lowest point prior to the boom, yet fresh in memory, was reached in the fall of 1878. A little activity in the trade early in 1879 gives the lines of the diagram some little irregularity before the great rise occurs which commenced in the fall of that year. The boom culminated in February of 1880, from which point there was a rapid fall, what we may call the normal level being reached in June of that year. Since that date there have been no great fluctuations in prices. From the chart before us we learn that the lowest price of tin plate in the period named was \$4.62 per box, being the rates for "B V" grade of coke plates in September 1878.

The highest price was reached in April and May, 1872, when "Melyn" grade sold at \$13.75 per box. The study of charts of this kind, although it has no practical bearing upon present business, is always of interest. Such diagrams upon the walls of an office, therefore, are quite appropriate.

William E. Dodge.

At a meeting of the Iron and Metal Exchange Co., Limited, held February 13th, President J. B. Brinsmade in the chair, the following resolution of respect for the memory of the late William E. Dodge was adopted:

Resolved, That the Board of Directors be requested to enter in full on the records of the Exchange the following minute: While the poor, the afflicted and others who need a helping hand are to-day grieving over the loss of Mr. William E. Dodge, their friend and helper, and while philanthropists are saddened because one who was their leader or their ever-ready condutor has ceased from his labors and gone to his long rest, it is met that we, the representatives of the trades in which the greater part of Mr. Dodge's business career was employed, should make some sign whereby our estimate of the man may be made an enduring record. Therefore we, the members of the Iron and Metal Exchange, do express the unanimous sentiment that our departed friend was throughout his long and successful business career a man without reproach. His life presents an example worthy of imitation, and in his death the trade has lost one of its most distinguished ornaments.

Remarks were made by J. B. Brinsmade, D. Willis James, B. F. Judson, Wm. Houston, and representatives of Bruce & Cook, Thomas Iron Company, Naylor & Co., Hendricks Bros., Lucius Hart & Co., and Bond, Parsons & Co.

### Conditions in the Center of the Scotch Iron Trade.

Mr. Robert P. Porter, in a recent letter to the *Tribune*, from Coatbridge, says: In the best mills the average weekly earnings of the laborer are from 18/ to 20/. If he is married he pays from £5 to £6 a year for such a house as those described above. If he is single he can obtain board and lodging for about 10/ a week. These lodgings are on what might be called the Box-and-Cox plan—that is, the "night hands" occupy the beds by day, and the "day hands" by night, beds by this process doing double service. Of course, the laborer cannot get much meat, as the prices of provisions are the same as in Glasgow. The mill hands earn, some as high as 35/ but I found from the books of one of the largest firms in Coatbridge that the average weekly earnings of an engineer did not exceed 23/, or 27/. Boys and young men make from 8/ to 10/ a week.

The progress in the production of coal and iron in Scotland has been great during the present century, having in the latter case increased from 8000 tons in 1800 to the present annual yield of 1,000,000 tons. The iron-producing materials are obtained over a comparatively small area, chiefly within and bordering on the valleys of the Clyde and Forth, and they are principally found in Lanarkshire (in which Coatbridge is located), Ayrshire being second in this respect. The other counties comprised within the coal and ironstone yielding area are Renfrewshire and Dumfriesshire in the vale of the Clyde, and Stirlingshire, Fife, Clackmannan, Kinross, East Lothian, Midlothian and Linlithgowshire, or West Lothian, in the vale of the Forth. The blast furnaces of Scotland are, with one exception, all situated within this area. Thus the iron making and producing districts may be said to extend from the Frith of the Forth, a little to the east of Edinburgh, to the opposite point on the west coast and to some distance south of this line, occupying in short that great central valley, consisting for the most part of the upper palaeozoic strata, and bounded by the northern highlands and southern uplands of the older palaeozoic or primary formations. This mineral district affords employment to about 80,000 persons in raising coal, ironstone and lime alone. It is about 80 miles in length, 40 miles in extreme breadth and 1500 yards deep. It is best developed in the vicinity of Coatbridge. According to the Royal Commissioners' report of 1871 (and I have no later statistics at hand), there was then contained over 2,000,000,000 tons of coals in Lanarkshire alone, and in the valley of the Clyde 900,000,000 tons within 1060 feet of the surface. The pits through which the minerals are raised vary from 30 to 180 fathoms in depth. The Government Inspector of Mines, Mr. Moore, makes the following annual estimate in respect to coal:

Rents paid to proprietors.....	\$1,000,000
Wages.....	10,000,000
Sales.....	15,000,000
Capital sunk in collieries.....	17,000,000

In 1875 the total minerals raised in the Scottish coal fields amounted to 21,778,480 tons, consisting of coal, ironstone, limestone and oil shale. It is this mineral wealth that has made the west of Scotland of such commercial importance. It is at the basis of the great iron shipbuilding interests of the Clyde, and the cheap fuel has also attracted other industries, such as the large textile factories and chemical works which cluster round Glasgow and play such an important part in the trade of Scotland.

The history of the manufacture of iron in Scotland, when compared with that of the Forest of Dean, in England, is comparatively modern, and may perhaps be dated from 1760, when the celebrated Carron Iron Works were erected. This was the first plant in Scotland where malleable iron was made. One of the principles of this company—and, I must confess, my experience leads me to add, of nearly all manufacturing firms in Scotland—is to keep the outside world ignorant of much of those internal economies which have been productive of so much commercial success. It is the most difficult task to obtain even trustworthy statements of the number employed and the wages paid, and almost impossible to find out anything of the technical operations. It was the Carron Iron

Works that refused to admit the poet Burns, and upon returning to the inn at Carron he immortalized the works by writing the following verses on the window of the room into which he was shown:

We came na here to view your works  
In hopes to be made wiser;  
But only, lest we gang to hell,  
It may be a surprise.

But when we tirl'd at your door,  
Your porter dought na bear us;  
So may, should we to hell's yetts come,  
Your billy, Satan, sair us.

### The Bay State Iron Company.

Boston, Feb. 12.—The suspension of the Bay State Iron Company, with liabilities of \$750,000, whose factories are in South Boston and in Port Henry, N. Y., was made public late this afternoon. Though the failure is partly due to the general dullness in the iron trade and the agitation of the question of changes in the tariff, its immediate cause is understood to be the refusal of banks in this city to make further loans of money on Western railroad bonds upon which the company have been borrowing. The banks refuse further loans on the bonds in view of recent decisions in some of the Western courts, giving the precedence as liens on the road to the bonds held by the States over those held by persons or corporations. Iron paper, however, of all kinds, has been somewhat unacceptable of late, and has been more closely scrutinized than paper from other firms, on account of the unsettled state of the iron market. When the banks decided not to further loan money to the company on their Western bonds, the officers of the Bay State Company called on their stockholders to help them over the present difficulties, but the latter did not care to risk more money, and suspension was the result. J. Avery Richards, the treasurer, is preparing a statement of the company's affairs, which is to be submitted at a meeting of the stockholders to be held to-morrow. The last official statement of the officers showed liabilities of over \$650,000, while their quick assets in accounts receivable and stock amounted only to \$450,000, but the plant is valued at \$100,000. Mr. Richards states that he thinks the company will eventually be able to meet all their liabilities in full. It is said that several of the stockholders are disposed to close up and sell out the business, and that one of the largest concerns in the iron business is disposed to take the works, or make some arrangement and buy them of their present owners and run them in the same line of business as at present. It is hoped that the stoppage of the works will be for a short time only, if they are stopped at all.

The directors have made an assignment of all the property of the company in the State of New York, which is not protected from attachment by the insolvent laws of Massachusetts, to a trustee for the equal benefit of all creditors without preference. Of the liabilities, \$269,000 are secured by a mortgage on the company's plant at South Boston and at Port Henry.

Boston, Feb. 13.—The stockholders of the Bay State Iron Company met this morning, \$100 of the total \$480 shares being represented. Treasurer Richards presented a statement of the company's condition, which shows the total assets to be \$1,377,466; liabilities, \$581,400. Of the entire unsecured debts those held in Boston are about \$90,000, while those held in New York and elsewhere constitute the balance. It was voted that the assignment of all real and personal property of the corporation in the State of New York, and of all debts due to the corporation from persons or corporations in the State of New York, to be made to trustees for the benefit of the creditors, be approved, and that the directors are authorized to wind up the affairs of the company as soon as possible.

The adjournment of the National Association of Stove Manufacturers without any action whatever with regard to prices, even to the extent of passing a perfunctory motion affirming last year's basis, is rather significant. We do not know that it shows anything of importance with regard to the probable future of the market, but it does show, with emphasis, that the association cannot deal with this question of prices as a trade combination. There was probably not one in the whole assembly who cared a rush whether one basis of selling price was adopted or another, inasmuch as every man in the trade would have gone home and sold for the very best prices he could obtain, without reference to whether those prices were above or below the basis fixed by the National Association. We have pointed out in previous issues some of the difficulties which beset this association in its efforts to make itself a trade combination, and we are not in any sense surprised that the more it tries to become a trade combination, the further it is from attaining that result. In a great many ways this meeting has been instructive, and it will probably furnish topics for more or less interesting editorial discussion in future issues.

It seems somebody at the West has faith enough in the old-fashioned U-rail to put money into a company organized for the purpose of manufacturing an improved form. In one form the rail is double, one U sitting on the back of another. The advantage, of course, claimed is that it is a continuous rail; while the top may be made of steel, the under part may be of iron. The next improvement that the company propose to put in operation is a U-rail where the upper rail is of the ordinary form and the lower one comes up into it, making a tube in which telegraph wires are to be laid. This is called a "telegraph" rail. The advantages to be gained by this arrangement, of course, are innumerable, and the disadvantages are undiscoverable from the standpoint of the company. We think railroad men will need a great deal of experiment to convince them of the advantages of the new form. There are certainly many great difficulties to be encountered in the way of making the McKinney rails, as they are called, successful. It is said that the company have bought the La Grange Iron and Steel Co.'s mills, at La Grange, Mo., and intend to commence rolling the new rails very shortly.



## Special Notices.

## LATE PUBLICATIONS.

*Gerhard, — House Drainage and Sanitary Plumbing.* By Wm. Paul Gerhard; illus., 205 pages, 33 by 6 inches, boards. \$0.50

This is a comprehensive and practical essay on those problems connected with house draining and sanitary plumbing which are of interest to builders and house owners. Drains outside and inside the house, soil and waste pipes, fresh-air inlets, trappings, fixtures, flushing appliances, ventilation of traps, plumbing regulations, plumbing fixtures, cisterns, water-closets, &c., are some of the subjects treated upon. The author's suggestions are reliable and expressed in a straightforward manner, making this a valuable addition to the recent treatises on plumbing.

*Clerk.—Theory of the Gas Engine.* By Dugald Clerk; 164 pages, 18mo, boards; 1882. \$0.50

This little work is a reproduction of an essay read at a meeting of the British Institution of Civil Engineers, and is an excellent presentation of the theory of the gas engine and the improvements made in this motor in the past few years. The paper embraces a number of diagrams of different types of gas engines, such as the Lenoir, Otto and Clerk engines, the Brayton petroleum engine, and several others.

FOR SALE BY

**DAVID WILLIAMS,**

Publisher and Bookseller,

83 Reade St., New York.

### New & Second-Hand Machinery.

FEB. 6, 1883.

Engine Lathes, 14 in. x 6 ft. Grant & Bogert. New.  
" 20 in. x 12 ft. Grant & Bogert. New.  
" 24 in. x 16 ft. Grant & Bogert. New.  
" 30 in. x 20 ft. Grant & Bogert. New.  
" 36 in. x 24 ft. Grant & Bogert. New.  
" 42 in. x 28 ft. Grant & Bogert. New.  
" 48 in. x 32 ft. Grant & Bogert. New.  
" 54 in. x 36 ft. Grant & Bogert. New.  
" 60 in. x 40 ft. Grant & Bogert. New.  
" 66 in. x 44 ft. Grant & Bogert. New.  
" 72 in. x 48 ft. Grant & Bogert. New.  
" 78 in. x 52 ft. Grant & Bogert. New.  
" 84 in. x 56 ft. Grant & Bogert. New.  
" 90 in. x 60 ft. Grant & Bogert. New.  
" 96 in. x 64 ft. Grant & Bogert. New.  
" 102 in. x 68 ft. Grant & Bogert. New.  
" 108 in. x 72 ft. Grant & Bogert. New.  
" 114 in. x 76 ft. Grant & Bogert. New.  
" 120 in. x 80 ft. Grant & Bogert. New.  
" 126 in. x 84 ft. Grant & Bogert. New.  
" 132 in. x 88 ft. Grant & Bogert. New.  
" 138 in. x 92 ft. Grant & Bogert. New.  
" 144 in. x 96 ft. Grant & Bogert. New.  
" 150 in. x 100 ft. Grant & Bogert. New.  
" 156 in. x 104 ft. Grant & Bogert. New.  
" 162 in. x 108 ft. Grant & Bogert. New.  
" 168 in. x 112 ft. Grant & Bogert. New.  
" 174 in. x 116 ft. Grant & Bogert. New.  
" 180 in. x 120 ft. Grant & Bogert. New.  
" 186 in. x 124 ft. Grant & Bogert. New.  
" 192 in. x 128 ft. Grant & Bogert. New.  
" 198 in. x 132 ft. Grant & Bogert. New.  
" 204 in. x 136 ft. Grant & Bogert. New.  
" 210 in. x 140 ft. Grant & Bogert. New.  
" 216 in. x 144 ft. Grant & Bogert. New.  
" 222 in. x 148 ft. Grant & Bogert. New.  
" 228 in. x 152 ft. Grant & Bogert. New.  
" 234 in. x 156 ft. Grant & Bogert. New.  
" 240 in. x 160 ft. Grant & Bogert. New.  
" 246 in. x 164 ft. Grant & Bogert. New.  
" 252 in. x 168 ft. Grant & Bogert. New.  
" 258 in. x 172 ft. Grant & Bogert. New.  
" 264 in. x 176 ft. Grant & Bogert. New.  
" 270 in. x 180 ft. Grant & Bogert. New.  
" 276 in. x 184 ft. Grant & Bogert. New.  
" 282 in. x 188 ft. Grant & Bogert. New.  
" 288 in. x 192 ft. Grant & Bogert. New.  
" 294 in. x 196 ft. Grant & Bogert. New.  
" 300 in. x 200 ft. Grant & Bogert. New.  
" 306 in. x 204 ft. Grant & Bogert. New.  
" 312 in. x 208 ft. Grant & Bogert. New.  
" 318 in. x 212 ft. Grant & Bogert. New.  
" 324 in. x 216 ft. Grant & Bogert. New.  
" 330 in. x 220 ft. Grant & Bogert. New.  
" 336 in. x 224 ft. Grant & Bogert. New.  
" 342 in. x 228 ft. Grant & Bogert. New.  
" 348 in. x 232 ft. Grant & Bogert. New.  
" 354 in. x 236 ft. Grant & Bogert. New.  
" 360 in. x 240 ft. Grant & Bogert. New.  
" 366 in. x 244 ft. Grant & Bogert. New.  
" 372 in. x 248 ft. Grant & Bogert. New.  
" 378 in. x 252 ft. Grant & Bogert. New.  
" 384 in. x 256 ft. Grant & Bogert. New.  
" 390 in. x 260 ft. Grant & Bogert. New.  
" 396 in. x 264 ft. Grant & Bogert. New.  
" 402 in. x 268 ft. Grant & Bogert. New.  
" 408 in. x 272 ft. Grant & Bogert. New.  
" 414 in. x 276 ft. Grant & Bogert. New.  
" 420 in. x 280 ft. Grant & Bogert. New.  
" 426 in. x 284 ft. Grant & Bogert. New.  
" 432 in. x 288 ft. Grant & Bogert. New.  
" 438 in. x 292 ft. Grant & Bogert. New.  
" 444 in. x 296 ft. Grant & Bogert. New.  
" 450 in. x 300 ft. Grant & Bogert. New.  
" 456 in. x 304 ft. Grant & Bogert. New.  
" 462 in. x 308 ft. Grant & Bogert. New.  
" 468 in. x 312 ft. Grant & Bogert. New.  
" 474 in. x 316 ft. Grant & Bogert. New.  
" 480 in. x 320 ft. Grant & Bogert. New.  
" 486 in. x 324 ft. Grant & Bogert. New.  
" 492 in. x 328 ft. Grant & Bogert. New.  
" 498 in. x 332 ft. Grant & Bogert. New.  
" 504 in. x 336 ft. Grant & Bogert. New.  
" 510 in. x 340 ft. Grant & Bogert. New.  
" 516 in. x 344 ft. Grant & Bogert. New.  
" 522 in. x 348 ft. Grant & Bogert. New.  
" 528 in. x 352 ft. Grant & Bogert. New.  
" 534 in. x 356 ft. Grant & Bogert. New.  
" 540 in. x 360 ft. Grant & Bogert. New.  
" 546 in. x 364 ft. Grant & Bogert. New.  
" 552 in. x 368 ft. Grant & Bogert. New.  
" 558 in. x 372 ft. Grant & Bogert. New.  
" 564 in. x 376 ft. Grant & Bogert. New.  
" 570 in. x 380 ft. Grant & Bogert. New.  
" 576 in. x 384 ft. Grant & Bogert. New.  
" 582 in. x 388 ft. Grant & Bogert. New.  
" 588 in. x 392 ft. Grant & Bogert. New.  
" 594 in. x 396 ft. Grant & Bogert. New.  
" 600 in. x 400 ft. Grant & Bogert. New.  
" 606 in. x 404 ft. Grant & Bogert. New.  
" 612 in. x 408 ft. Grant & Bogert. New.  
" 618 in. x 412 ft. Grant & Bogert. New.  
" 624 in. x 416 ft. Grant & Bogert. New.  
" 630 in. x 420 ft. Grant & Bogert. New.  
" 636 in. x 424 ft. Grant & Bogert. New.  
" 642 in. x 428 ft. Grant & Bogert. New.  
" 648 in. x 432 ft. Grant & Bogert. New.  
" 654 in. x 436 ft. Grant & Bogert. New.  
" 660 in. x 440 ft. Grant & Bogert. New.  
" 666 in. x 444 ft. Grant & Bogert. New.  
" 672 in. x 448 ft. Grant & Bogert. New.  
" 678 in. x 452 ft. Grant & Bogert. New.  
" 684 in. x 456 ft. Grant & Bogert. New.  
" 690 in. x 460 ft. Grant & Bogert. New.  
" 696 in. x 464 ft. Grant & Bogert. New.  
" 702 in. x 468 ft. Grant & Bogert. New.  
" 708 in. x 472 ft. Grant & Bogert. New.  
" 714 in. x 476 ft. Grant & Bogert. New.  
" 720 in. x 480 ft. Grant & Bogert. New.  
" 726 in. x 484 ft. Grant & Bogert. New.  
" 732 in. x 488 ft. Grant & Bogert. New.  
" 738 in. x 492 ft. Grant & Bogert. New.  
" 744 in. x 496 ft. Grant & Bogert. New.  
" 750 in. x 500 ft. Grant & Bogert. New.  
" 756 in. x 504 ft. Grant & Bogert. New.  
" 762 in. x 508 ft. Grant & Bogert. New.  
" 768 in. x 512 ft. Grant & Bogert. New.  
" 774 in. x 516 ft. Grant & Bogert. New.  
" 780 in. x 520 ft. Grant & Bogert. New.  
" 786 in. x 524 ft. Grant & Bogert. New.  
" 792 in. x 528 ft. Grant & Bogert. New.  
" 798 in. x 532 ft. Grant & Bogert. New.  
" 804 in. x 536 ft. Grant & Bogert. New.  
" 810 in. x 540 ft. Grant & Bogert. New.  
" 816 in. x 544 ft. Grant & Bogert. New.  
" 822 in. x 548 ft. Grant & Bogert. New.  
" 828 in. x 552 ft. Grant & Bogert. New.  
" 834 in. x 556 ft. Grant & Bogert. New.  
" 840 in. x 560 ft. Grant & Bogert. New.  
" 846 in. x 564 ft. Grant & Bogert. New.  
" 852 in. x 568 ft. Grant & Bogert. New.  
" 858 in. x 572 ft. Grant & Bogert. New.  
" 864 in. x 576 ft. Grant & Bogert. New.  
" 870 in. x 580 ft. Grant & Bogert. New.  
" 876 in. x 584 ft. Grant & Bogert. New.  
" 882 in. x 588 ft. Grant & Bogert. New.  
" 888 in. x 592 ft. Grant & Bogert. New.  
" 894 in. x 596 ft. Grant & Bogert. New.  
" 900 in. x 600 ft. Grant & Bogert. New.  
" 906 in. x 604 ft. Grant & Bogert. New.  
" 912 in. x 608 ft. Grant & Bogert. New.  
" 918 in. x 612 ft. Grant & Bogert. New.  
" 924 in. x 616 ft. Grant & Bogert. New.  
" 930 in. x 620 ft. Grant & Bogert. New.  
" 936 in. x 624 ft. Grant & Bogert. New.  
" 942 in. x 628 ft. Grant & Bogert. New.  
" 948 in. x 632 ft. Grant & Bogert. New.  
" 954 in. x 636 ft. Grant & Bogert. New.  
" 960 in. x 640 ft. Grant & Bogert. New.  
" 966 in. x 644 ft. Grant & Bogert. New.  
" 972 in. x 648 ft. Grant & Bogert. New.  
" 978 in. x 652 ft. Grant & Bogert. New.  
" 984 in. x 656 ft. Grant & Bogert. New.  
" 990 in. x 660 ft. Grant & Bogert. New.  
" 996 in. x 664 ft. Grant & Bogert. New.  
" 1002 in. x 668 ft. Grant & Bogert. New.  
" 1008 in. x 672 ft. Grant & Bogert. New.  
" 1014 in. x 676 ft. Grant & Bogert. New.  
" 1020 in. x 680 ft. Grant & Bogert. New.  
" 1026 in. x 684 ft. Grant & Bogert. New.  
" 1032 in. x 688 ft. Grant & Bogert. New.  
" 1038 in. x 692 ft. Grant & Bogert. New.  
" 1044 in. x 696 ft. Grant & Bogert. New.  
" 1050 in. x 700 ft. Grant & Bogert. New.  
" 1056 in. x 704 ft. Grant & Bogert. New.  
" 1062 in. x 708 ft. Grant & Bogert. New.  
" 1068 in. x 712 ft. Grant & Bogert. New.  
" 1074 in. x 716 ft. Grant & Bogert. New.  
" 1080 in. x 720 ft. Grant & Bogert. New.  
" 1086 in. x 724 ft. Grant & Bogert. New.  
" 1092 in. x 728 ft. Grant & Bogert. New.  
" 1098 in. x 732 ft. Grant & Bogert. New.  
" 1104 in. x 736 ft. Grant & Bogert. New.  
" 1110 in. x 740 ft. Grant & Bogert. New.  
" 1116 in. x 744 ft. Grant & Bogert. New.  
" 1122 in. x 748 ft. Grant & Bogert. New.  
" 1128 in. x 752 ft. Grant & Bogert. New.  
" 1134 in. x 756 ft. Grant & Bogert. New.  
" 1140 in. x 760 ft. Grant & Bogert. New.  
" 1146 in. x 764 ft. Grant & Bogert. New.  
" 1152 in. x 768 ft. Grant & Bogert. New.  
" 1158 in. x 772 ft. Grant & Bogert. New.  
" 1164 in. x 776 ft. Grant & Bogert. New.  
" 1170 in. x 780 ft. Grant & Bogert. New.  
" 1176 in. x 784 ft. Grant & Bogert. New.  
" 1182 in. x 788 ft. Grant & Bogert. New.  
" 1188 in. x 792 ft. Grant & Bogert. New.  
" 1194 in. x 796 ft. Grant & Bogert. New.  
" 1200 in. x 800 ft. Grant & Bogert. New.  
" 1206 in. x 804 ft. Grant & Bogert. New.  
" 1212 in. x 808 ft. Grant & Bogert. New.  
" 1218 in. x 812 ft. Grant & Bogert. New.  
" 1224 in. x 816 ft. Grant & Bogert. New.  
" 1230 in. x 820 ft. Grant & Bogert. New.  
" 1236 in. x 824 ft. Grant & Bogert. New.  
" 1242 in. x 828 ft. Grant & Bogert. New.  
" 1248 in. x 832 ft. Grant & Bogert. New.  
" 1254 in. x 836 ft. Grant & Bogert. New.  
" 1260 in. x 840 ft. Grant & Bogert. New.  
" 1266 in. x 844 ft. Grant & Bogert. New.  
" 1272 in. x 848 ft. Grant & Bogert. New.  
" 1278 in. x 852 ft. Grant & Bogert. New.  
" 1284 in. x 856 ft. Grant & Bogert. New.  
" 1290 in. x 860 ft. Grant & Bogert. New.  
" 1296 in. x 864 ft. Grant & Bogert. New.  
" 1302 in. x 868 ft. Grant & Bogert. New.  
" 1308 in. x 872 ft. Grant & Bogert. New.  
" 1314 in. x 876 ft. Grant & Bogert. New.  
" 1320 in. x 880 ft. Grant & Bogert. New.  
" 1326 in. x 884 ft. Grant & Bogert. New.  
" 1332 in. x 888 ft. Grant & Bogert. New.  
" 1338 in. x 892 ft. Grant & Bogert. New.  
" 1344 in. x 896 ft. Grant & Bogert. New.  
" 1350 in. x 900 ft. Grant & Bogert. New.  
" 1356 in. x 904 ft. Grant & Bogert. New.  
" 1362 in. x 908 ft. Grant & Bogert. New.  
" 1368 in. x 912 ft. Grant & Bogert. New.  
" 1374 in. x 916 ft. Grant & Bogert. New.  
" 1380 in. x 920 ft. Grant & Bogert. New.  
" 1386 in. x 924 ft. Grant & Bogert. New.  
" 1392 in. x 928 ft. Grant & Bogert. New.  
" 1398 in. x 932 ft. Grant & Bogert. New.  
" 1404 in. x 936 ft. Grant & Bogert. New.  
" 1410 in. x 940 ft. Grant & Bogert. New.  
" 1416 in. x 944 ft. Grant & Bogert. New.  
" 1422 in. x 948 ft. Grant & Bogert. New.  
" 1428 in. x 952 ft. Grant & Bogert. New.  
" 1434 in. x 956 ft. Grant & Bogert. New.  
" 1440 in. x 960 ft. Grant & Bogert. New.  
" 1446 in. x 964 ft. Grant & Bogert. New.  
" 1452 in. x 968 ft. Grant & Bogert. New.  
" 1458 in. x 972 ft. Grant & Bogert. New.  
" 1464 in. x 976 ft. Grant & Bogert. New.  
" 1470 in. x 980 ft. Grant & Bogert. New.  
" 1476 in. x 984 ft. Grant & Bogert. New.  
" 1482 in. x 988 ft. Grant & Bogert. New.  
" 1488 in. x 992 ft. Grant & Bogert. New.  
" 1494 in. x 996 ft. Grant & Bogert. New.  
" 1500 in. x 1000 ft. Grant & Bogert. New.

THE TANTIE CO. and GRANT & BOGERT MACHINE TOOL WORKS.

H. PRENTISS & CO., 42 Day St., N.Y.

**J. SEIDEL.**

Commission Merchant,

Box 662,

HABANA, CUBA.

Will be happy to accept the representation of first-class houses manufacturing hardware.

Reference:

COLLINS & CO., 212 Water Street, New York.

To Brass Foundries.

To Brass Manufacturers.

Our new foot press, for cutting of GATES from brass castings by FOOT power, is now ready. Weight, 250 lbs. Price complete, \$20. A boy can operate it easily. We warrant them to give the most perfect satisfaction. PERKINS PUNCH AND SHEAR CO., 100 W. 12th Street, New York.

WANTED—A position as Superintendent or Designer and Draughtsman, by a man of long experience in the management of men and work, and in designing a great variety of new machinery, including Marine, Pumping, Stationary and Portable Engines, Gunworks, Machinists' Tools and Boilers. Accustomed to fix their strength and capacity, make out their bills of material, estimate the cost and price. Familiar with pattern work, the foundry and forge. Shall be ready to engage by the 1st of April. Can furnish the best of references, but prefer to enter upon trial before settling upon terms. Address W. H. Cor. East 9th and Ouellet sts., old No. 67, Cologno, N.Y.

A GENTLEMAN, young and active, holding a responsible position connected with the management of a prominent Iron Foundry in Philadelphia, being desirous of change, would accept position as Manager, Salesman, &c., where energy and a knowledge of general business forms would be of value.

Would join another in agency or commission business. Reference first-class.

CUPOLA.  
Office of The Iron Age, 225 S. 4th St., Phila., Pa.

MANAGER WANTED—For a small Anthracite Furnace using largely magnetic ores. A situation good place for a thoroughly competent man. Address, stating age, experience and pay expected.

FERRO.  
Box 672, New York City.

EXPERIENCED DRAUGHTSMAN,  
Mechanical and Civil Engineering, wants situation. References.

Office of The Iron Age, 53 Reade St., New York.

WANTED—By a young man thoroughly familiar with the general Iron Foundry trade, a situation as traveling salesman in Colorado or adjoining States. Has had eight years' experience in the store and on the road. Address

## Special Notices.

### New and Second-Hand Iron Working MACHINERY.

Two Engine Lathes, 42 in. x 15 ft. Triple Geared. Ames, New, August.  
One Engine Lathe, 30 in. x 18 ft. Fifeled. New, Aug. 1.  
One Engine Lathe, 28 in. x 18 ft. Ames, New.  
One Engine Lathe, 28 in. x 18 ft. Ames, New.  
One Engine Lathe, 28 in. x 17 ft. Fifeled. New.  
Two Engine Lathes, each 24 in. x 10 ft. Fifeled. New, Ames.

Two Engine Lathes, 24 in. x 10 ft. Fifeled. New.  
Three Engine Lathes, 20 in. x 12 ft. Ames, New.  
Three Engine Lathes, 20 in. x 10 ft. Ames, New.  
One Engine Lathe, 20 in. x 10 ft. Jones & Lamson New.  
Two Engine Lathes, 18 in. x 7 ft. Amesley & Harrington, New, Ames.

One Engine Lathe, 18 in. x 6 ft. 8 in. Bridgeport Mch. Tool Works, New.  
Six Engine Lathes, 18 in. x 6 ft. 7 in. Ames, New.  
One Engine Lathe, 15 in. x 6 ft. with Turret. Plathens, New.

Two Engine Lathes, 14 in. x 6 ft. Star Tool Co. New.  
Six Engine Lathes, 13 in. x 6 ft. Ames, New.  
Two Engine Lathes, 13 in. x 4 ft. Ames, New.  
Six Hand Lathes, 12 in. x 5 ft. Hendey, New.  
One Chucking Lathe, 24 in. x 48 in. New.  
Two Pulley Turning Machine, 24 in. x 36 in. New.

One Crank Planer, 12 in. Belden, New.  
One Planer, 16 in. x 3 ft. Belden, New.  
Two Planers, 20 in. x 4 ft. Morse Lathe and Tool Co.  
One Planer, 24 in. x 6 ft. Gleason, New.  
One Planer, 24 in. x 6 ft. Ames, New.  
One Planer, 28 in. x 6 ft. Gleason, New.  
One Planer, 30 in. x 6 ft. Second Hand, Good order.  
One 6 in. Stroke Shaper, Boynton, New.

Two 9 in. Stroke Shapers, Hewes & Phillips.  
One 14 in. Stroke Shaper, Hendey, New.  
One 15 in. Stroke Shaper, G. & S. F. New.  
One 24 in. Stroke Shaper, Hendey, New.  
One Screw Machine, No. 1, Wire Feed, P. & W.  
One Screw Machine, No. 2, P. & W.  
One Screw Machine, No. 3, P. & W.  
One 3 Spindle Drill, No. 1, Pratt & Whitney.

One 6 Spindle Drill, No. 1, Pratt & Whitney.  
One 20 in. Upright Drill, Prentiss, New.  
Two 22 in. Upright Drills, Prentiss, New.  
One 30 in. Upright Drill, Prentiss, New.  
One 36 in. Upright Drill, New Haven, New.

Three 36 in. Upright Drills, New.  
23 Lincoln Millers and vises, Good order.  
One 10 lb. Air Hammer, Hotchkiss, Good order.  
One 20 lb. Bradley Hammer, At.  
One 40 lb. Bradley Hammer, Merrill, At.  
Two 40 lb. Drop Hammers, Merrill, At.

All sizes Bradley Hammers furnished to order promptly.

E. P. BULLARD, 14 Day St., New York.

GENERAL EASTERN AGENT FOR

Akron Iron Co.'s Patent Hot Polished Shafting.

### For Sale.

### A SCRAP YARD.

Located at Pittsburgh, Pa.,

Twenty-first & Smallman Sts.

95x120 feet; four Shears, Boiler, Engine, Carls,

&c. Yard now in operation. Good opportunity

for parties understanding the business.

Address FOX & DRUMMOND,

68 Wall St., N. Y.

### For Sale.

A machine with oscillating rolls for rolling shapes. Face of rolls, 15 inches long, and necks 7 inches diameter. Will be sold cheap if applied for immediately.

Address "NOYS,"

Office of The Iron Age, Pittsburgh, Pa.

Fine Machinery for Sale, or Investment in a

Joint Stock Company.

We have the latest improved Steam Power Machinery for the manufacture of wagon complete. We have already established for the wagon of our manufacture a large trade and fine reputation. This machinery is for sale for cash or part cash, and balance in approved paper, or it will be put into a stock company at its appraised value, in full-up stock, &c. R. H. B. & Co., Agents for the G. A. Kelly Mfg. Co., Jefferson, Texas.

### Founder Wanted,

for an Anthracite Furnace in New York. Must be a thoroughly competent man, capable of taking full charge of running. State experience and wages expected.

Address FAIR,

Office of The Iron Age, 83 Reade St., New York.

### Wanted.

A position as Rolling Mill Manager by a thoroughly practical man, who has had twelve years' experience in the manufacture of all kinds of plate, bar iron, &c. Best reference from present employers.

Address ROLLING MILL,

Office of The Iron Age, 225 So. 4th St., Phila., Pa.

MAGNIFICENT OPENING.—Business Manager wanted, to take controlling interest in an established tool factory making big dividends. Owner must sell or substitute a man to represent him. Capital wanted, \$100,000 to \$200,000; property taken for the interest. Facts confidential.

Address CHANGE 1000,

Care Nat. Ex. Bureau,

Fostoria, Ohio.

### Wanted.

A Salesman of experience to travel and sell Heavy Hardware in the West. He must have a thorough and practical knowledge of Hardware, and an acquaintance with the trade in the West. One having these qualifications, and who can furnish unexceptionable references as to character and ability, may apply to or address

S. H. & E. Y. MOORE,

165 and 167 Lake St., Chicago, Ill.

### Wanted.

An experienced, practical man to superintend the manufacture of Foundry Iron at the furnaces (two) of the Albany City Iron Company.

Apply (in the first instance) by letter only to

WM. R. HILLS, Treas.,

Albany, N. Y.

WANTED—By an energetic young traveling man of 6 years' experience, a first-class Hardware, Tool or Specialty House to represent on commission. Is well acquainted with the trade throughout and Canada. Can furnish the best of references. Address E. S. care A. G. Shattuck, 86 Nassau St., New York.

WANTED—An experienced Chemist, thoroughly familiar with the different branches of the Iron and Steel industry, is open for engagement. Situation as Assistant Superintendent at steel works preferred. First-class references. Address

W. J. WHITE,

251 West 17th Street, New York City.

A FIRST-CLASS ROLL TURNER and Designer of Rolls wishes a situation, 20 years of good practice. Designing Rolls for shapes a specialty. Three years' practice in this country.

Address R







## AMERICAN SPRING HINGES

Single Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Double Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Single Acting.

Length of Flanges.	For Doors.	Polished Brass.	Per pair.
3 1/2 in.	3/4 to 1 1/4 in.	745... 12 00...	750...
4 in.	1 to 1 1/2 in.	841... 13 00...	846...
5 in.	1 1/4 to 2 in.	937... 14 00...	942...
6 in.	1 3/4 to 2 1/4 in.	1033... 15 00...	1038...
8 in.	2 to 2 3/4 in.	1229... 16 00...	1234...
10 in.	2 1/4 to 3 in.	1425... 17 00...	1430...
12 in.	2 3/4 to 3 1/2 in.	1621... 18 00...	1626...

Double Acting.

Length of Flanges.	For Doors.	Polished Brass.	Per pair.
3 1/2 in.	3/4 to 1 1/4 in.	745... 12 00...	750...
4 in.	1 to 1 1/2 in.	841... 13 00...	846...
5 in.	1 1/4 to 2 in.	937... 14 00...	942...
6 in.	1 3/4 to 2 1/4 in.	1033... 15 00...	1038...
8 in.	2 to 2 3/4 in.	1229... 16 00...	1234...
10 in.	2 1/4 to 3 in.	1425... 17 00...	1430...
12 in.	2 3/4 to 3 1/2 in.	1621... 18 00...	1626...

Single Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Double Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Single Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Double Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Single Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Double Acting.

Length of Flanges.	For Doors.	Copper Bronzed, Dark Color.	Berlin Bronzed, Olive Color.
3 1/2 in.	3/4 to 1 1/4 in.	No. pair. No. pair.	Per pair.
4 in.	1 to 1 1/2 in.	506... 3 25 80...	510...
5 in.	1 1/4 to 2 in.	602... 4 50 80...	606...
6 in.	1 3/4 to 2 1/4 in.	698... 5 75 80...	704...
8 in.	2 to 2 3/4 in.	894... 7 00 80...	900...
10 in.	2 1/4 to 3 in.	1090... 8 25 80...	1096...
12 in.	2 3/4 to 3 1/2 in.	1286... 9 50 80...	1292...

Gem Door Springs, Japanned and Coppered, 50¢ to 55¢ per pair. Gem Door Springs, Galvanized and Nickel Plated, 60¢ to 65¢ per pair. Star Door Springs, Japanned and Coppered, 50¢ to 55¢ per pair. Star Door Springs, Galvanized and Nickel Plated, 60¢ to 65¢ per pair. Torrey Door Springs, 40¢ to 45¢ per pair. Gray's, 45¢ to 50¢ per pair. Domestic Blind Adjusters, 25¢ to 30¢ per pair. Ratchet Bed Keys, 15¢ to 20¢ per pair. Show Case Spring Hinges, 10¢ to 15¢ per pair. Gem Wire Coat and Hat Hooks, 10¢ to 15¢ per pair.

## IRON.

**American Pig.**—The past week's market has been characterized by the same general features which have prevailed for some months past, and with the exception of a sale of a medium sized lot of Foundry Iron, we hear of nothing to relieve the monotony of the market. While choice grades of Foundry Irons continue firm and comparatively scarce, there is a decided weakness in inferior grades, and prices of such Irons are altogether in buyers' favor. The position is one of uncertainty, and it is almost impossible to form any definite opinion as to the future of the market. We repeat last week's quotations: Standard Foundry brands, No. 1 X, \$25; No. 2 X, \$23, and Gray Forge, \$20 @ \$21, all at tidewater.

**Scotch Pig.**—Although there is a little more inquiry, the demand continues light and principally for lots of a retail character. The tone of the market is weak and somewhat irregular. We hear of sales of something over 1000 tons, but figures have not been made public. Part of the arrivals during the week have gone into store. We quote as follows: Eglinton, \$21.50 @ \$22; Carnbroe and Glengarnock, \$22 @ \$23; Colness, \$24.50 @ \$25; Gartsherrie and Langloan, \$24.50 @ \$25; Summerlee, \$24.75.

**Steel Rails.**—There is no change to note either in demand or prices. Nothing of an interesting nature has transpired during the week. Orders are being placed from time to time, but not of such a size as to call for particular mention; \$40 at tidewater is firmly quoted, and there appears to be less disposition to book orders at this figure than a short while ago.

**Old Rails.**—There is so little doing that the market may be said to be almost nominal. We hear of a sale of a small lot of Double Heads at \$27.50. We quote Tees, \$24.50 @ \$25.

**Scrap Iron.**—There is little if any, improvement in the demand for Scrap, although there is some little inquiry. We quote \$27 @ \$28 for No. 1 Wrought.

## METALS.

**Copper.**—Business under this chapter has become positively stagnant, sales being of a jobbing character merely, and trifling. We leave our quotations of the previous week unaltered, and call Lake 18¢; "Anchor" brand, 17 1/4¢; Ordinary Arizona, 17¢, and Baltimore, 16 1/2¢. Although it has now become doubtful whether during this session of Congress the tariff will undergo any change, the uncertainty suffices to keep business in Metals duller than it otherwise, perhaps, would be. The winter so far this year has at the same time been unusually trying, especially out West, all of which has contributed to paralyze trade. As for the inundations, disastrous as they may be in the valleys of the Ohio and other places, they may become more so still in the Mississippi Valley proper next month; at least this is apprehended. Should these fears be realized, even the spring trade may prove less active than is now hoped, and there may be disappointments in some items, as, for example, last spring the sale of White Lead was interfered with in those remote sections. We merely make these remarks in order to explain why people in the metal trade entertain no sanguine expectations with respect to the coming spring trade, although it is granted that the country at large is in a flourishing condition, and pretty certain that the husbandman will obtain a good price for his crop remnants, in view of the deplorable state of affairs in the agricultural regions of Central and Western Europe.

The entire metal trade seem to agree that under the circumstances it is the best policy not to anticipate in the way of purchasing, if it can be helped, which feeling intensifies the dullness among us. London came per cable yesterday \$72, Best Selected; and \$65, 10¢, Chili Bars. We receive this afternoon from London the ensuing cablegram: "Moderate business done during past week, market closing quiet, with prices unsteady. Best Selected, \$71 @ \$72; and Chili Bars, \$65, 5¢ @ \$65, 10¢. Manufacturers have made no change in prices. They quote: Bottoms, 31¢ @ 32¢; Braziers, 30¢ @ 31¢; Circles, 33¢ @ 34¢; Sheathing, 28¢, and Bolt Copper, 30¢; Segment Sheets, 33¢; Fire-Box do, 30¢.

**Tin.**—No spirit seems to get into the Tin dealers on either side of the Atlantic, which in part is no doubt also due to the uncertain commercial outlook in Europe and here. London cable Straits Tin \$73 yesterday. To-day we receive direct from there the following message: "Market active, with good business done, and prices steady. Straits, 80¢ @ 81¢ @ 82¢, 10¢, and futures, 80¢ @ 81¢ @ 82¢, 10¢. Large lines of Straits on the spot would not bring over 21¢ to-day, while in a jobbing way 21 1/2¢ @ 21 3/4¢ may still be obtained. L. and F. we nominally quote, 22¢ @ 22 1/2¢. Tin Plates.—A steady, fair demand is noticeable all along. We quote large lines, ordinary brands, 7¢ box; Charcoal Bright, 6¢ @ 6 1/2¢; do, Termes, \$5.37 1/2 @ 5.50; Coke Tin, \$5.12 1/2 @ 5.25, and do, Termes, \$5 @ 5.12 1/2. Liverpool has remained steady. It cabled Coke yesterday 16¢ @ 17¢, and Charcoal, 18¢ @ 20¢. We are informed from London to-day that the market is dull and prices steady.

**Lead.**—Nothing has transpired during the week in the wholesale line. For the present buyers do not feel disposed to make any offer above 4 1/2¢, while holders in store insist

on \$4.70 for Common Domestic. We therefore leave the quotation nominally 4 1/2¢. As for Corroding Lead, in which nothing has transpired either, we also leave the nominal quotation 4 1/2¢. At East St. Louis we hear the asking price for Corroding is 4 1/2¢, while \$4.20 is offered, to which from there 40 1/2¢ freight would have to be added. From London we receive the ensuing cablegram: "Market dull and prices weak and lower. Business moderate. Common English Pig, £13, 7/6 @ £13, 17/6." Manufacturers are quoted as follows: Lead Pipe, 6 1/2¢; Sheet Lead, 7 1/2¢; Tin-lined Lead Pipe, 15¢ @ 16¢, and Block-tin Pipe, 45¢, less the usual discount to dealers.

**Spelter and Zinc.**—The apathy which has existed in Common Spelter for a couple of months past is unbroken, and in the absence of larger transactions we cannot quote Domestic any better than 4 1/2¢, nominally, while Silesian is held at 5¢ @ 5 1/2¢. We quote Bertha Refined 8 1/2¢, and Bergenport 9 1/2¢. Sheet Zinc—is inactive at 6 1/2¢ @ 6 3/4¢. We receive from London the cable message below: "Very little business done, market closing dull and prices weak. Ordinary, at shipping ports, £15, 10¢ @ £15, 15 1/2¢.

**Antimony.**—Hallett's brand sells to a limited extent at 10 1/2¢, and Cookson's at 11 1/4¢.

## COAL.

The Anthracite Coal miners are now working on half-time, and up to date the output is slightly in excess of the quantity produced last year for the same period. The dullness prevailing is characteristic of the season, and not much improvement can be expected before the opening of navigation at points now closed by ice. About \$4.30 on board may be quoted as a fair average for the Domestic sizes. The opening rates for the season are as yet only conjectural. Eastward there are occasional shipments, and the rate to Boston is quoted \$1.25 @ \$1.30; to Providence, 80¢ @ 85¢.

The Bituminous trade is considerably exercised in regard to the pending agreement between the Baltimore and Ohio and Pennsylvania companies, designed to do away with special rates and rebates, thus giving the Clearfield and Cumberland regions an equal advantage. We hear it positively stated that an arrangement has been reached, and that the terms will be made public in a week or ten days. It is suggested, furthermore, that the heavy consumers will be in no condition to pay an advance on last year's rates.

## IMPORTS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending February 14, 1883.

Hardware.	Read D. W. R. & Co.
Baker, Hermann & Co.	Ore, tons, 450
Hdw., cutlery, &c.	Ore, lot, 1
Brown Bros. & Co.	Plz, tons, 156
Cases, 12	Ore, tons, 1705
Calhoun, Hollins & Co.	Old fish plates, kg.
Arms, cs, 2	Sheets, bxs, 10
Clairmont, A. & Bro.	Wire rods, bbls, 19
Machinery, cs, 267	Old rails, 323
Conover J. S. & Co.	Buildings, 7
Files, cs, 25	Rods, bbls, 135
Curley J. & Bros.	Old rails, 323
Dolge Alfred	Buildings, 7
Mdse., cs, 4	Rods, bbls, 135
Drexel, Morgan & Co.	Old rails, 323
Files, cs, 25	Buildings, 7
Field Alfred & Co.	Rods, bbls, 135
Mdse., cs, 8	Old rails, 323
Baring Bros. & Co.	Buildings, 7
Boyle, cs, 1509	Rods, bbls, 135
Baldwin Bros. & Co.	Old rails, 323
Bloms, 49	Buildings, 7
Greenmount Spring Co.	Rods, bbls, 135
Mdse., cs, 9	Old rails, 323
Koth John F.	Buildings, 7
Machinery, case, 1	Rods, bbls, 135
Low A. & Bro.	Old rails, 323
Bath tubs, pkgs, 2	Buildings, 7
Mechanics' Disp. Co.	Rods, bbls, 135
Arms, cs, 7	Old rails, 323
Moss E. & Bro.	Buildings, 7
Files, cs, 3	Rods, bbls, 135
Putney D.	Old rails, 323
Gun barrels, case, 1	Buildings, 7
Rosenthal J. & Co.	Rods, bbls, 135
Arms, cs, 5	Old rails, 323
Schoverling, Daly &	Buildings, 7
Mdse., cs, 8	Rods, bbls, 135
Arms, cs, 3	Old rails, 323
Sussex, L. & Sen &	Buildings, 7
Nordlieger	Rods, bbls, 135
Cases, 3	Old rails, 323
Vom Cleft & Co.	Buildings, 7
Hoops, 1938	Rods, bbls, 135
Cases, 29	Old rails, 323
Wichsch, Hilger & Co.	Buildings, 7
Hdw., cutlery, &c.	Rods, bbls, 135
pkgs, 7	Old rails, 323
Witte John G. & Bro	Buildings, 7
Cutlery, cs, 3	Rods, bbls, 135
Order.	Old rails, 323
Machinery, case, 1	Buildings, 7
Crates and cases, 12	Rods, bbls, 135
Ironware, cs, 3	Old rails, 323
Tin pils, bxs, 2721	Buildings, 7
Crookes Robert & Co.	Rods, bbls, 135
Tin pils, bxs, 700	Old rails, 323
Dickerson, Va. & Dusen	Buildings, 7
Tin pils, bxs, 9155	Rods, bbls, 135
Edison E. Light Co.	Old rails, 323
Mdse., cs, 16	Buildings, 7
Larnich's & Sons	Rods, bbls, 135
Wire rods, bbls, 191	Old rails, 323
Lombard's A. C. & Sons	Buildings, 7
Tin pils, bxs, 55	Rods, bbls, 135
Gun caps, cs, 6	Old rails, 323
Monte P. J. & Sons	Buildings, 7
Old brass, cs, 5	Rods, bbls, 135
Old metal, cs, and	Old rails, 323
bbls, 7	Buildings, 7
Neyes, Smith & Co.	Rods, bbls, 135
Gun caps, cs, 2	Old rails, 323
Plock & Co.	Buildings, 7
Tin slabs, 1111	Rods, bbls, 135
Phelps Dodge & Co.	Old rails, 323
Tin pils, bxs, 2677	Buildings, 7
Pope Thos. J. & Son	Rods, bbls, 135
Rail heads, 1319	Old rails, 323
Reich C. B. & Co.	Buildings, 7
Gun caps, case, 1	Rods, bbls, 135
Schverling, Daly &	Old rails, 323
Gales	Buildings, 7
Gun caps, cs, 5	Rods, bbls, 135
Carriage cases, cs,	Old rails, 323
The Lalance & Grojean	Buildings, 7
Mig Co.	Rods, bbls, 135
Tin pils, bxs, 267	Old rails, 323
Black pils, bxs, 51	Buildings, 7
Yat. & Porterfield	Rods, bbls, 135
Composition, bbls, 7	Old rails, 323
Copper, bbl, 1	Buildings, 7
Order.	Rods, bbls, 135
Tin pils, bxs, 1124	Old rails, 323
Q'silver bottles, 93	Buildings, 7
Lug rods, 100	Rods, bbls, 135
Blasting caps, cs, 43	Old rails, 323
Leut, cs, 22	Buildings, 7
Antimony, cs, 50	Rods, bbls, 135
Tin slabs, 2178	Old rails, 323
Small type.	Buildings, 7

## EXPORTS

of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending February 13, 1883:

Danish West Indies.		Operto.	
Quant.	Val.	Quant.	Val.
Brass g'd case, 1	\$ 18	Mf. iron, pkgs, 10	\$ 20
Hdw., pkgs, 18	124	Clocks, pkgs, 49	92
W. g'd case, 1	3	Cartridges, box, 1	2
Ag. imp. pkgs, 3	138	Ag. imp. pkgs, 5	10
Ptms, gals, 2843	50	Ptms, gals, 69,000	69
Lead, pkgs, 1	50		
Mf. iron, pkgs, 11	50	<b>Brazil.</b>	
Mf. iron, pkgs, 11	84	Revolvs, bxs, 10	8
		Rifles, cs, 3	51
		Revolvers, case, 1	37
		Sew. ma., cs, 10	27
		Pumps, pkgs, 93	23
		Ptms, gals, 81,658	10,433
		Nails, pkgs, 51	19
		Hdw., pkgs, 61	1,604
		Cartridges, 5	9
<b>Venezuela.</b>			
		Nails, pkgs, 17	8
		Mf. iron, pkgs, 108	1,116
		Ag. imp. pkgs, 14	2
		Ptms, gals, 27,685	3,260
		Cutlery, cs, 9	6
		Cop goods, cs, 2	2
		Cast's, case, 1	1
		Mach'y, pkgs, 724	244
		Cartridges, cs, 9	9
		W. mull., 1	5
		Nails, cs, 5	5
		Hdw., pkgs, 10	1,041
		Sew. ma., cs, 110	31
		Clocks, cs, 7	10
		Scalps, bxs, 10	35
		Scalps, bxs, 10	35
		Revolvers, cs, 3	73
		Saw, 1	50
<b>Bordeaux.</b>			
		Ag. imp. pkgs, 619	11,619
		Ptms, gals, 193,622	8,555
<b>Cette.</b>			
		Ptms, gals, 23,650	16,721
<b>Marseilles.</b>			
		Ptms, gals, 22,421	15,835
		Mf. iron, pkgs, 1	1
<b>French West Indies.</b>			
		Ptms, gals, 10,000	1,050
		Ag. imp. pkgs, 1	1
		Mach'y, pkgs, 1	1
		Mf. iron, pkgs, 6	40
<b>Peru.</b>			
		Ag. imp. pkgs, 3	13
		B. balls, box, 1	13
		Ptms, gals, 3,500	225
		Sew. ma., cs, 17	13
<b>Cadiz.</b>			
		Ptms, gals, 20,250	2,350
<b>Mexico.</b>			
		Hdw., pkgs, 24	2,559
		Pumps, pkgs, 14	1,284
		Mach'y, pkgs, 89	7,232
		Cartridges, 4	3,602
		Mt g'ds, case, 1	1
		Ptms, gals, 23	1,313
		Ptms, gals, 8,800	8,800
		Cartridges, cs, 21	456
		Nails, pkgs, 151	505
		Scalps, bxs, 1	1,300
		Steel, bxs, 1	1
		Gun impts, 60X 1	61
		W. c's's, pkgs, 6	122
		Iron shaws, 22	22
		Clocks, bxs, 14	14
		Mf. iron, pkgs, 359	3,949
		Beils, box, 1	1
		Ag. imp. pkgs, 67	957
		Cutlery, cs, 3	63
		Nails, cs, 14	2,070
		Scales, bxs, 4	4
		Pistols, cs, 5	1,232
		Tacks, cs, 5	1,232
		W. mull, cs, 10	1,074
		Firearms, cs, 3	1,074
		Car wh's, &c	
		A. p. .... 4	1,191
		Shoe nails, bxs, 23	230
		Ir. tubes, 1	1
<b>Chili.</b>			
		Nails, bxs, 200	1,212
		Ptms, gals, 10,000	4,340
		Cutlery, cs, 8	4,340
		Beils, cs, 3	48
		Copper, case, 1	38
		Nails, cs, 1	1
		H'n's h's, kegs, 30	1,720
		Mach'y, pkgs, 16	1,608
		Hdw., cs, 3	608
		Scalps, bxs, 1	1
		Crtridges, 1	1
		Piping, feet, 35	101
<b>Argentine Republic.</b>			
		Rifles, cs, 4	4
		Mach'y, pkgs, 41	1,271
		Ptms, gals, 140,250	14,930
		Sh b's balls, bxs, 140	533
		Hdw., pkgs, 180	4,243
		Sew. ma., cs, 10	1,427
		Ag. imp. pkgs, 82	12,145
		Ar. guns, case, 1	1
		Saws, 100	189
		Zincs, cs, 2	60
		Cartridges, cs, 12	23
		Stimpdwe, cs, 15	1,459
		Mf. iron, pkgs, 7	100
		Scalps, cs, 4	100
		Revolvers, case, 1	849
<b>Genoa.</b>			
		Clocks, bxs, 2	25
<b>Central American.</b>			
		Hdw., pkgs, 31	723
		Ptms, gals, 14,241	2,241
		Scales, cs, 3	24
		Shot, bxs, 5	15
		Mf. iron, pkgs, 5	15
		Revolvers, case, 1	1
		Mach'y, pkgs, 27	21
		Tin plate, box, 1	20
		Sew. ma., cs, 13	283
		Nails, pkgs, 13	1,187
		Cutlery, cs, 1	1
		Y. metal, cs, 3	274
		Nails, kegs, 35	103
		Tacks, cs, 2	38
		Nails, cs, 1	24
		Pistols, case, 1	1
<b>Catania.</b>			
		Mach'y, pkgs, 5	95
<b>Venice.</b>			
		Clocks, cs, 18	1,515
<b>Santo Domingo.</b>			
		Sew. ma., cs, 6	226
		Lt g'ds, pkgs, 3	43
		Hdw., pkgs, 10	121
		Nails, pkgs, 13	65
		Cutlery, cs, 1	1
		Mf. iron, pkgs, 0	87
		Iron safe, 1	200
<b>Haiti.</b>			
		Ptms, gals, 143,000	470
		Tacks, cs, 1	2
		Iron safe, 1	2
		Cop. works, case, 1	10
		Calos, cs, 2	2



**Bessemer Iron.**—There is some inquiry, and buyers could be found at \$21.50, but sellers appear to be holding at about a dollar higher. The probabilities are that business will be closed at concessions by both parties.

**Spiegel-eisen.**—Market very weak; 20% offered at \$33, and 10% at \$27. Buyers not inclined to make offers.

**Muck Bars.**—The demand is very moderate and prices weak. Asking prices are \$37 @ \$37.50, but concessions have been made on large lots.

**Blooms.**—Business has been a little more active, with sales chiefly at the following quotations, viz.: Charcoal Blooms, \$64 @ \$66; Run-out Anthracite, \$56 @ \$58; Scrap Blooms, \$49 @ \$51; Northern Ore Blooms, \$47.50.

**Bar Iron.**—There is not much change to notice. The market has been dull and dragging, with only a small business at about last week's figures. There has been no change in quotations, but prices are very irregular. Buyers who are prepared to place good-sized orders can obtain concessions according to quantity, specification and quality, but for the ordinary run of business 2 3/4 @ 2 3/8 is obtained for Refined Iron. In other cases all sorts of prices have been named, from 2 1/2 upward for what is claimed to be Refined Iron, and as low as 2 1/4 for Common. It is a long time since there was such depression as now prevails, but it is generally believed to be of a temporary character, and largely, if not altogether, due to the uncertainty in regard to the tariff. The general outlook is considered to be entirely satisfactory, and there is an almost universal expectation of a healthy spring trade. Stocks have been run down to the lowest point possible, and as a large amount of new business is likely to come on the market at an early date, manufacturers are disposed to regard the present inactivity with some degree of equanimity. Skelp Iron is quiet at about 2 3/8 for Grooved and 2 5/8 for Sheared.

**Plate and Tank Iron.**—The feeling is something better in this department, although sales have not been of special importance. There is more inquiry, however, and from some directions a certainty that business will be placed on the market at a very early date. Tank Iron and Boat Plate have been inquired for, and manufacturers are generally very firm at 2 5/8 as the usual quotation. The asking price is as before, viz.: 2 5/8 @ 2 6/8 for Tank and Boat Plate, 3 5/8 for Shell, 4 25/8 @ 4 5/8 for Flange, and 5 5/8 for Fire-Box. A sale of over 100 tons Tank Iron was made to-day at something below 2 5/8.

**Structural Iron.**—There is no change in this department; business is still very dull and dragging, but prospects are improving. It is understood that some large orders will be on the market in course of a few weeks, and there is every reason to expect that the mills will have plenty of work during the spring and summer months. Prices are not very strong, but are generally quoted: 2 5/8 for Angles, 3 25/8 for Tees, 3 5/8 for Beams, and 3 7/8 for Channels.

**Sheet Iron.**—The market is very dull, and sales in quantity are difficult to make. Competition has been very strong in some quarters, to meet which prices have been shaded considerably, although the best makers have held prices very steady. Small lots may be quoted as follows:

Common Sheets, No. 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

**Boiler Tubes.**—Prices are weak, with 55% discount as a nominal quotation. Steam Pipe is badly demoralized, and quoted all the way from 65 to 70% discount from list price.

**Steel Rails.**—The market is dull; prices weak and irregular. Manufacturers quote \$40 at mill, and in a small way are entering orders, but in most cases would be willing to shade a dollar per ton on large lots. Buyers appear to be quite indifferent, however, and at \$39 even there is no great demand. It is a long time since the market had so gloomy an appearance as at present, although it is probable there will be quite an active demand as soon as the tariff is definitely fixed. In the meantime both sides are disposed to wait and take whatever risks there may be in a policy of that kind.

**Crop Ends.**—There has been very little demand of late, although to-day \$21.50 was bid and refused for a lot ex-ship Baltimore. Sellers ask \$22, which is more than consumers are inclined to pay at the moment. A lot of old Steel Rails was sold yesterday at about \$23 on cars at Philadelphia.

**Old Rails.**—The market is very dull, and except for small lots there is very little demand. Double Heads are offered to arrive at \$27.50, and T's on spot, \$26 @ \$26.50, with small lots taken at these figures. Large lots could be had at much lower figures for spring delivery.

**Scrap Iron.**—The market is quiet and unchanged at \$26 @ \$28, according to selection.

**Nails.**—Market very dull at about \$3.40, less the usual trade discount.

## PITTSBURGH.

(By telegraph to The Iron Age.)

Pittsburgh, Pa., Feb. 14, 1883.

The Western Nail Association met in regular monthly session to-day, the mills at Pittsburgh, Wheeling and the valleys only being represented. The old card rate, \$3.40 7/8 keg, with usual discounts, was unanimously reaffirmed. Reports showed that Eastern mills were offering Nails delivered at Western points below this, but it was decided to take no notice of their action. Stocks are light, but demand is not heavy, owing largely to the state of the weather. Merchant Iron is quoted at 2 1/2 @ 2 25/8 in small lots, but larger buyers and well-sorted orders can be placed at less rates, though the low rates that have been quoted are not for Bar Iron, but special lots of extras. The trustees of A. Kloman have to-day called a meeting of their creditors.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., Feb. 13, 1883.

There is a wide difference of opinion in regard to the general Iron trade. While it is admitted by all that the business is very unsatisfactory at present, some are hopeful in regard to the immediate future, while others are despondent. The former, with good weather and the tariff question disposed of, look for an early improvement, and these are in the majority; but the latter are disposed to take an opposite view, basing it largely on overproduction, claiming that the country is producing more Iron, both Raw and Finished, than can be consumed. It must be admitted that there has been an overproduction of Pig Iron during the past six or eight months, but this will be regulated by furnaces blowing out; a number have done so already, and others contemplate doing likewise very soon. The production of Finished Iron has also been reduced. Many of the Western mills have within the past few weeks changed from double to single turn, and unless there is a change for the better some will no doubt shut down altogether. There is no question but the uncertainty of the action of Congress in regard to the tariff has had a good deal to do with the unsettled and very unsatisfactory condition of the Iron trade for some time past. One of our most prominent manufacturers, who has just returned from an extended Western trip, reports that country bare of stock, and says that both buyers and consumers, apprehensive of lower prices, are buying only as their immediate necessities require. The feeling, however, in Iron circles is that it would be much better to have the tariff remain as it is than to pass the bill as it now stands.

**Ore.**—There is nothing new to report. This important interest is, as might be expected, very unfavorably affected by the depression in Pig Iron, and the blowing-out of so many furnaces is very discouraging to the Ore companies, many of whom begin to think that the dividends for 1883 will be comparatively light. It is stated, unofficially, that the Republic Ore Company have fixed the price for this year at \$3. As yet furnacemen are refusing to make contracts ahead, preferring to take the chances and buy only to supply their immediate wants.

**Pig Iron.**—The situation has not changed perceptibly since the date of our last report. Business has been fair, several good sized sales having been effected, and while prices continue weak, there has been no further change. Furnacemen generally are of the opinion that the market has touched the lowest point, and this view is also entertained by some consumers, but there are others of the latter who predict a still further decline. The most favorable feature, so far as relates to the producing interest, is the blowing-out of furnaces and thereby reducing the production, although the fact that consumers generally have very light stocks is also in favor of the furnacemen. We can report sales in a regular way at \$22.50 @ \$23.50, 4 mos., for No. 1 Foundry; \$21 @ \$21.50, for No. 2; \$19.50 @ \$20.50, 4 mos., for Neutral, and \$21 @ \$22 for All-Ore Forge. Sale of 800 tons Neutral Forge at \$20, cash, and 1000 tons do. at \$19, cash. The former is a very popular brand in this market.

**Bessemer Iron.**—Is believed to be down to the very bottom; \$22.50, 4 mos., has been the price for two or three weeks past, and there are now but few sellers at the price quoted, although during the week under review there was a sale of 2000 tons at the price in question. Bessemer, it is claimed, is lower relatively than Ordinary Mill.

Within the past four or five weeks there have been sales of 20,000 tons reported in the market—8000 at \$23, 4 mos., and 10,000 and 2000 at \$22.50, 4 mos.

**Muck Bar.**—Continues very dull, and prices are weak and lower. Good Neutral is now offered at \$35, cash, at mill, and it is rumored that sales have been made as low as \$34.50. It is claimed that Muck has declined more and is lower relatively than Pig Iron.

**Manufactured Iron.**—The general position of the market remains unchanged. Business continues very unsatisfactory and unsettled, but some of our manufacturers look for an early change for the better, and it is to be hoped that their expectations may be fully realized. Prices may be quoted on a basis of 1 9/16 @ 2 1/8 for Bars, the latter being bed-rock, and only very desirable orders can be placed at it.

**Nails.**—According to agreement, all the Nail factories west of the Allegheny Mountains were started up yesterday; after running three weeks they will be stopped again for two weeks, the object being to prevent an accumulation of stock before the spring trade opens up. Prices remain unchanged at \$3.40, 60 days, 2% off for cash, with usual abatement of 10% per keg on carload lots and upward. The prospect for a good spring trade is most encouraging. Wheeling will commence shipping to St. Louis the latter part of the present week.

**Wrought Iron Pipe.**—There is a good deal of business offering, but manufacturers are refusing to contract for large lots at present prices, which, it is claimed, afford little or no margin for profit. Discounts on Gas and Steam Pipe, 70 @ 70 1/2 & 5%; on Boiler Tubes, 55% off.

**Steel Rails.**—May be fairly quoted at \$39 @ \$40, cash, at mill; not many buyers at \$40, and sellers are reluctant to sell at \$39.

**Old Rails.**—Your correspondent made a mistake in last week's report in regard to American Tee Rails, by saying that they had been offered at \$25, delivered in Pittsburgh, without finding buyers. They were offered here at the price in question, but it was for future delivery, sellers' option. For immediate delivery the lowest sales as yet reported have been at \$26.20 @ \$26.50; a lot of 400 tons was sold here last week at \$26.50. Nothing doing here in Double Heads, and the demand for Tees is light. Old Steel Rails quoted, nominally, at \$23 @ \$24.

**Railway Track Supplies.**—Railway Spikes remain unchanged at 2.80 @ 3 lb.; Track Bolts, 3.50 @ 3.75 with square and 3.75 @ 3.90 with hexagon nuts; Splice Bars, 2 1/4 @ 2 3/8.

**Bessemer Billets.**—Are still quoted at \$43 @ \$45 1/2 ton, according to carbon.

**Scrap.**—The Scrap trade continues dull and prices weak, but without notable change during the past week. Wrought Scrap, \$25 @ \$26 for Ordinary, and \$27 1/2 net ton for Selected; Wrought Turnings, \$18 @ \$20; Car Axles, \$36 @ \$38; Steel Rail Ends.—So far as known, there have been no sales here as yet below \$25 1/2 gross ton; Old Car Wheels, very dull—offered at \$23.50 1/2 gross ton, without finding buyers; Cast Borings, \$14 @ \$14.50.

**Steel.**—The general Merchant Steel trade continues dull and unsettled, being affected unfavorably by the uncertainty in regard to the tariff.

**Coke.**—To use a common phrase, the bottom has dropped out of this important interest, and, what is still worse, there is not much prospect of any immediate improvement. The blowing-out of a number of Pig Iron furnaces has largely reduced consumption, although at the low prices now ruling increased shipments eastward are looked for, as it is expected to take the place, to a considerable extent, of Anthracite Coal. We now quote at \$1.15 per ton, free on cars at ovens, in a regular way, and \$1.30 @ \$1.40 for small foundry orders. It is expected that the production will be materially reduced before long.

## CHICAGO.

Office of The Iron Age, 36 and 38 Clarke St., cor. Lake, Chicago, Feb. 12, 1883.

**Hardware.**—The unfavorable condition of the weather during the early portion of the past week caused considerable interruption to business generally. With the opening up of the present week, however, orders are coming in more freely and shipments are made more promptly, while a good tone pervades the market for Shelf and Heavy Hardware, with prices remaining firm.

**Nails.**—Are comparatively firm at \$3.50 7/8 keg for 10d to 6d., with the usual discount of 2% off for cash. Stocks in dealers' hands are fair.

**Manufactured Iron.**—Somewhat of an increased activity is to be noted in this market at present writing over that of the week past, and the outlook for a good spring trade is more encouraging. We quote: Bar Iron, 2 3/8 @ 2 4/8 rates; Angle Iron, 3 1/8 @ 3 3/8 rates; T Iron, 4 1/8 rates; Beams, 3 8/8 @ 3 9/8 rates; Tank Iron, 3 5/8 @ 3 7/8 rates; Sheet Iron, 3 2/8 @ 3 4/8 rates; Norway Original Bars, 4 1/8 rates; Norway Re-rolled Bars, 5 1/8 rates; Ulster, 4 1/8 rates; Low Moor Iron, 8 1/8 rates; Nuts and Washers, 8 1/8 off list; Wrought Boat Spikes, 3 1/4 rates.

**Pig Iron.**—We note a fair market and a good demand for Charcoal Pig Iron, while quotations continue unchanged. We quote: Lake Superior Charcoal, Nos. 1 and 2, \$24; No. 3, \$25, and Nos. 4, 5 and 6, \$26.50, 4 months; Calumet, \$24 @ \$25, 4 months; Briar Hill, \$25; Silvery Soft, \$23 @ \$24; Crane No. 1, \$27.50; No. 2, \$26.50; Hamrod, \$24.50; Thomas, \$27.50 @ \$28; American Scotch, \$24.50 @ \$25; Imported Scotch, \$32; Du Val, No. 1, \$24; No. 2, \$23; Fulton Notch, No. 2, \$22.50; No. 3, \$21.50, and Southern Coke, \$24.50.

**Steel.**—The inquiry for Tool, Machinery and Agricultural Steel has been moderate, and prices, with a few exceptions, are unchanged. We quote as follows: Tool, 12; Machinery O. H., 5; Crucible Machinery, 7; Hammer, 2 inches and under, 8; over 2 inches, 9; Cast Spring, 6; and O. H. Spring, Tire and Sleigh Shoe, 5; Sheet, first, second and third quality, 12, 10 1/2 and 8 1/2 respectively; Crucible Plow, 6; Eagle Plow, 5; Iron Center Plow, 9 1/4; and Soft Steel Center Plow, 9 1/4; Cast Plow, 5; German Plow, 4 1/2.

**Scrap Iron.**—Market continues dull, with but little inquiry. The following are the purchasing prices paid by dealers: No. 1 Railroad Wrought Scrap, 1/2 net ton, \$22; No. 1 Country Wrought Scrap, 1/2 net ton, \$21; No. 1 Cast Scrap, 1/2 ton, \$17; No. 1 Stove Plate Scrap, 1/2 ton, \$12; Machine Shop Wrought Turnings, 1/2 ton, \$10; Cast Iron Borings, \$7.

## CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., Chattanooga, Feb. 12, 1883.

The weather during the week has been extremely unfavorable for outdoor work. Mud is fatuous and rain is constant. General movements of heavy material are quite up in amount to the usual trade of the season, while special contracts are being made for large supplies, deliverable during the year. Streams are flush and boating trade is good.

**Pig Iron.**—Production is going forward at the usual rate and increasing somewhat, except in fine Foundry, which the wet weather puts a damper on. This grade of Iron, owing to unfavorable conditions for making it, has become very scarce. There are no stocks at furnaces. Contracts are being freely made for delivery of supplies for several months of the year, at about quotations for smaller lots, and \$1 @ 50¢ 1/2 ton less for large. We quote: No. 1 Foundry, \$22 @ \$23; No. 2 Foundry, \$20 @ \$21; Gray Forge, \$18 @ \$19; White and Mottled, \$18 @ \$20; Car-wheel Metal, \$31 @ \$35.

**Ores.**—We quote: 50% Brown Hematite, 1/2 ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

**Miscellaneous Articles.**—Old rails dull at \$25. Scraps are dull. Wrought, \$18 @ \$22; Cast Scrap, \$11 @ \$14; Old Wheels, \$24.

**Nails.**—We quote at \$3.40 strong for large lots at mills, 60 days; 15% higher for small bills.

**Manufactured Iron.**—Bar has slightly improved since our last report. We quote at \$2.40. Railroad Spikes, \$3.20; Track Bolts, \$3.75; Fish Plate, \$2.50.

**Coal.**—We quote: Fancy Lump, \$4.50; Common, \$3.50 @ \$4; run of mine to manufacturers, \$2.

**Coke.**—We quote: Furnace Coke, \$1 at point of consumption; Foundry, 10¢ @ 12¢ 1/2 bushel.

**Steel and Iron Rails.**—The Ram Mill is working up a lot of stock into Re-rolled Iron Bars. There will be no more Steel Rails made in the South until our manufacturers secure the use of the basic or some similar process.

## CLEVELAND.

Messrs. Rhodes & Co., of Cleveland, send us the following under date of the 6th inst.: The chronicler who essays to tell a cheerful tale about the present condition of the Iron market has a difficult and well-nigh impossible task. The market seems to be in a demoralized condition. During the past month the volume of Pig Iron business has been large; a number of contracts involving considerable amounts have been made, but the prices obtained are not such that should cause any elation to the parties who have taken them. We have heard that one buyer, who was covering sales of his manufactured article, bought his Iron for \$3000 less than he had figured he would be able to when he closed his own contracts of sale. The competition for good-sized orders is so keen that prices are made irrespective of present or probable future cost. It seems to be a general *sic ut qui puit*.

The reason for this condition of affairs is not because there are large stocks of Pig Iron, for the stock is a mere bagatelle; nor is it because producers are generally in financial straits, for never in the history of the Western Pig Iron industry has their financial condition been as sound as to-day, and money is in good supply at the loaning centers for any legitimate demand. Frequently, with much larger stocks, with many more bills payable, with rate of interest higher and money hard to get, have Western producers held their product with a devotion and grit worthy of a better general business outlook than they had. We have said so often that the general outlook now is good that it may seem tiresome to repeat it. In 1881 the crop of all kinds of grain was 2,053,500,000 bushels; in 1882 the crop of all kinds of grain was 2,685,000,000; in 1881 the cotton crop was 2,585,686,378 pounds, and in 1882 the cotton crop was 3,082,000,000 pounds. With a country so largely agricultural as our own, could one hope for a better basis for good business than those figures represent?



Old Wheels, 19,000 lbs. 22.00  
Wrought Scrap, No. 1, 22.00  
Cast Scrap, No. 1, 22.00  
Richmond Refined Bar Iron, 2.40  
Horse Shoes (Tredgill), 5.50

## Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From Our Regular Correspondent.)

LONDON, ENG., Jan. 29, 1883.

### THE SITUATION

cannot be said to have undergone any change for the better since my last letter; indeed, I should probably be within the limits of credulity if I said that there has been a positive retrogression in almost all branches of our trade and commerce. Somehow or other things do not seem to move along as they ought. Our French neighbors have another crisis on hand, and are apparently doing their best to magnify the ridiculous escapade of Plon Plon into dimensions which may serve the purpose of a domestic ministry, but cannot do any good to the Republic or to the nation at large. With the new ministry, of which we have telegrams this afternoon, it is hoped this *fiasco* will be permitted to die out. Until the matter shall have been disposed of in some way or other the commercial classes of France will not resume their wonted pursuits with confidence. That they have been terribly scared within the past week or ten days is shown by the fact that enormous amounts of money have been sent here for reinvestment, and, if I am rightly informed, large sums have also been sent to the United States. Then, again, so long as France is in a volcanic condition, so long must Germany be watchful and uneasy, seeing that it is an accepted maxim that some day or other France will seek to recover Alsace and Lorraine from the lately victorious Fatherland. Further East, the relations between Russia and Austria would appear to have become more amicable, the visit of M. de Giers to Vienna being reported to have been conceived on pacific lines. In Turkey trade is slow and small of volume, owing to the notorious impotency of the Sultan and the entire nation. Elsewhere we are pretty much as described by me last week. At home our prospects are not specially bright. Gales and floods have been the features of the week, and neither has improved the outlook for the farmers. In the North there have been snow storms and perfect deluges of rain, while on and near our coasts some of the most terrible shipwrecks on record have taken place. The *Cimbria* disaster has naturally been much commented upon. Pending the inquiry into its causes it will not be fair to enter into details, but I think it is permissible to say now that the wreck, as well as the late sinking of the *City of Brussels* and other steamers, will cause a lively discussion as to the merits and demerits of iron and steel as shipbuilding materials. Wood had its faults, but it is claimed that no wooden vessel would sink in 10 or 15 minutes after a collision, unless the rent in its "skin" were of truly gigantic dimensions—whereas the piercing of an iron plate seems to settle a metallic ship outright.

### THE IRON MARKETS

have been lifeless and weaker all round, with scarcely a single exception. The lowering of the bank rate from 5 to 4 1/2 on Thursday last came too late to be of much assistance to the business of last week, and I am writing too early this week to judge of the effects of the change, but I suppose it will be of some little assistance to speculators, as well as to struggling merchants and manufacturers. So far this year, however, the spirit of speculation has been quite dormant, hardly an effort in that direction having been noticeable. In the absence of such a stimulus the market has been left dependent on the consumptive demand, and as that has been abnormally light the outcome is as stated. One would suppose that there would be something or other likely to lead speculators to operate, and as they have not done so it is but reasonable to assume that they do not regard the outlook with very sanguine eyes. In this they are not by any means singular, for there appears to be a tacit consensus of opinion that prospects are not brilliant. Some there are who look for an expansion of business next month, but even these do not venture to indulge in cock-sure speculation. They may, possibly, be correct in taking that view, for the simple reason that matters cannot well be worse than they are now, and, by parity of reasoning, when things are at the worst they must begin to mend. Clearly, however, much will depend upon the course of politics on the Continent and upon your tariff changes. Should France calm down and the Austro-Russian difficulty be smoothed over, the Continent may devote itself to industrial pursuits, while your tariff changes, if in the direction of beneficial reductions, may do our manufacturers a great deal of good.

At Glasgow warrants have scarcely moved at all during the week, and remain at 47 to 48 1/2 ton, with only a poor demand. Makers' brands are about as of late, both in Cleveland and in Scotland, albeit at Middlesboro' No. 3 has been cut about at lower figures by some of the merchants. On the West Coast hematite pigs are remarkably inanimate at late rates, which the smelters are making desperate efforts to uphold. Few new orders are coming to hand from the Bessemer men, and your market is almost paralyzed by the uncertainty as to the tariff changes. Elsewhere all classes of crude irons are being pushed by holders at lower figures, in order to persuade consumers and others to renew their purchases. Even under these conditions the sales effected have been limited in number and volume. The wire manufacturers have lowered their prices to 23 1/2 ton, and the galvanized iron makers are very irregular. For sheets there is a fair demand at about 28 for ordinary grades, and other sorts *pro rata*. Market bars are 27 to 28, as before, and all other prices are nominally unaltered, but virtually unaltered to an extent unknown

for a long time past. For iron rails there are a few small inquiries in the market for light sections, which are quoted at 25 and upward, but the movement in this class of articles is necessarily extremely small under existing conditions. Old rails are very dull and nominal at your cable rates. There are a few inquiries for shipments to the States, but I have not heard of any sales of moment lately. There is some little call for heavy wrought scrap iron, which is called 58 1/2 @ 60 1/2 ton, f.o.b. London, but freights are said to be high and scarce for that class of material. For old railway leaf-spring steel buyers offer 14, 10, c.i.f. New York, and 14 1/2 Philadelphia or Baltimore, but the selling price is nominally 2/6 more. Blooms are not much sought after, and are nominal at 14 1/2 @ 14 3/4 ton, with lowest offers on East and West Coasts. Crop ends are 57 1/2 @ 62 1/2 ton, run of the mill, but are not in demand for export. The steel-rail market is extremely dull, and prices are so "subject to special quotations" that it is useless to record the open rates. Probably 14 1/2 would be accepted for usual sections and weights, or even less for a large order. Bolekow-Vaughans are making 5000 tons weekly, and are again preparing to enlarge their rate of production.

### SCOTCH PIG IRON

has been very dull since my last report, with a decline in warrants and an almost entire absence of speculation. The demand for makers' brands is also quiet, perhaps owing to the larger importations of Middlesboro' pig iron into Scotland. Should this importation grow we might expect a reduction in Scotch iron, makers' brands of which have for some months past been dear, as compared with the price of warrants. There are now 107 furnaces at work in Scotland (including nine on hematites), against 105 a year ago. The three furnaces at Calder under repair will shortly be restarted. In Connal's stores there are 602,813 tons (a decrease last week of 925 tons), against 631,090 tons this date 1882, and 637,526 tons in June, 1882. Shipments to date this year have increased 7115 tons on a total of 33,622 tons, while importations from Middlesboro' have been 20,421 tons, a decrease of 1310 tons this year. Writing from Glasgow on January 27, James Watson & Co. said: "The Scotch iron market has been flat this week, the price of warrants having receded 6d. 1/2 ton, with an absence of speculative buying, and a quieter demand for makers' iron. The Middlesboro' market is also exceedingly dull and very little fresh business is reported. On Monday last the warrant market opened at 48 3/4, with a small business transacted down to 48 1/2 1/2 ton. On Tuesday business was done from 48 3/4 to 48 1/2, cash, and on Wednesday the price further receded to 47 10, cash. Yesterday the market rallied to 48 1/2, but today the improvement was lost, as low as 47 9 1/2 being accepted, closing with buyers at 47 10, sellers naming 47 10 1/2 1/2 ton. The shipments last week were 8051 tons, as compared with 7742 tons for the corresponding week of last year." We quote:

	No. 1.	No. 2.	No. 3.
G. M. B., at Glasgow	48 3/4	48 1/2	48 1/4
Clyde	48 3/4	48 1/2	48 1/4
Colonsay	48 3/4	48 1/2	48 1/4
Langhau	48 3/4	48 1/2	48 1/4
Guthrie	48 3/4	48 1/2	48 1/4
Summerlee	48 3/4	48 1/2	48 1/4
Calder	48 3/4	48 1/2	48 1/4
Cambridge	48 3/4	48 1/2	48 1/4
Glencairn, at Ardrossan	48 3/4	48 1/2	48 1/4
Edinburgh	48 3/4	48 1/2	48 1/4
Dalmellington	48 3/4	48 1/2	48 1/4
Shotts, at Leith	48 3/4	48 1/2	48 1/4
Kinnell, at Leith	48 3/4	48 1/2	48 1/4
Carroll, at Grangemouth	48 3/4	48 1/2	48 1/4

### MIDDLESBORO' PIG IRON

has felt the depressing influences which have pervaded and are pervading the market generally. No. 3 is very irregular and may be bought in one quarter or another at any price between 42 and 42 9/16 ton. Stocks in the stores are decreasing, but it is believed that the returns for the month will not show any material general decrease, as the shipments are not good, even for the season. For G. M. B. net cash, less 2 1/2%, f.o.b. at makers' wharves in the Tees, current prices are:

	No. 1.	No. 2.	No. 3.
No. 1 Foundry	46 9/16	Mottled	41 3/4
" " "	44 9/16	White	40 9/16
" " "	42 9/16	Refined metal	38 9/16
" " "	40 9/16	Kentledge	36 9/16
" " "	38 9/16	Cinder	34 9/16

### HEMATITE PIG IRON

is dull and nominal, despite the efforts of the West Coast smelters to uphold values. Extremely little business is being done, with mixed parcels at 51 to 53, and makers' brands for moderate-sized lots as under:

	No. 1.	No. 2.	No. 3.
Cleator	51 1/2	51 1/4	51 1/8
Lonsdale	51 1/2	51 1/4	51 1/8
Workington	51 1/2	51 1/4	51 1/8
West Cumberland	51 1/2	51 1/4	51 1/8
Lowther	51 1/2	51 1/4	51 1/8
How-Bay	51 1/2	51 1/4	51 1/8
Deighton	51 1/2	51 1/4	51 1/8
Harrington	51 1/2	51 1/4	51 1/8
Soway	51 1/2	51 1/4	51 1/8
Marport	51 1/2	51 1/4	51 1/8

### THE NORTHERN IRON TRADE.

I give you the subjoined report made by Mr. Waterhouse, the sworn accountant to the Northern Board of Arbitration, not only for its interest *per se*, but also as being likely to be of service should your "free-ship" resolution come in on April 1:

GENTLEMEN: Having collected from the firms and companies belonging to your board the returns of their sales of manufactured iron during the three months ending December 31st last, and having verified the same by an examination of their books, I certify the average net selling price 1/2 ton to have been as follows: Of all classes of iron, 26 5/8; of all classes of iron with the exception of rails, 26 7/8. The sales during the three months ending December 31st, 1882, of all classes of iron were 154,240 tons, of which 103,315 were rails.

### YOUR TARIFF

discussions are still followed with undiminished interest, although it is feared, somehow, that things won't work round as they ought to do—from a British standpoint, of course. At the moment, the general opinion is that the Democrats will have the tariff revision in their own hands next year, and that no changes of moment appear to be likely this session. The Paris correspondent of the *Ironmaster* says: "An American manufacturer in Paris informs me that he sees no prospect of an amendment of the United States tariff this year. He said to me: 'We shall still continue to use Jessop's steel at our screw works. It is rolled a little closer than other material which might be purchased at a cheaper rate in America. Our steel makers are very inexperienced, as compared with English hands. It is only a few years since American steel acquired any reputation in the market. Still, we do not care to make any change in the material manipulated by our men. They have been used to Jessop's steel for years past, and, as they work it with much greater facility than any other, they would be seriously disconcerted were any American steel to be placed in their hands. Not that the American steel cannot bear comparison with some of the steel which we import, but when men have trained themselves to a particular class of steel they know exactly how to deal with it; their manipulation becomes a second nature to them, as it were, and any tentative experiments would represent a serious loss of time, trouble and money.' What have your 'very inexperienced' steel makers to say about this?"

### IN TIN PLATES

there have been no developments of note during the week. The demand does not show any particular expansion, mostly owing to the slackness of the inquiry from your market, which is not buying with freedom—a fact attributed here to tariff uncertainties. The banks in South Wales and elsewhere are realizing tin plates for the recovery of advances made to the firms which failed recently, and so are keeping down prices. Whether there would have been greater buoyancy in the absence of such realizations is a matter for conjecture, but such appears to be likely, viewing the recent great decrease in the rate of production. For best stamping charcoals, 23 1/2 @ 25 1/2; best charcoal, 21 1/2 @ 22 1/2; common charcoal, 20 1/2 @ 20 1/2; good coke brands, 16 1/2 @ 17 1/2; common cokes, 15 1/2 @ 16 1/2, and coke ternes, L.C., 15 1/2 @ 16 1/2, are quotations.

### AN EXTRAORDINARY YARN.

Since the days of Barnum's old razor trick on board ship I have come across nothing equal to the following truly extraordinary yarn, which I give you *verb. et lit.*, as I clip it from a newspaper: "The mystery is the number of cheap razors which go to New York. These razors were not made to shave, but to sell. Their makers say of them that they are as useless against a beard as a brick. What was their destination? What was their use? Inquiry was urgent, and the discovery was presently made 'that the article was used for razor fights among the New York dinkies. They get the blade loose in the handle, and when a debate waxed warm they whip out the razor, swing back the blade against the hilt, and go to work to slice a man's face into chips. Such is the story. In South America razors are used for cutting sugar canes. The juice destroys the weapon after a day's work, and the cutter throws it away, beginning with a fresh razor next morning. Hence the enormous consumption.' Now, if there be any 'mystery' in this dark business, pray let us have it revealed. I know nothing of the New York dinkies; you should know everything. We look to *The Iron Age* for enlightenment, anyhow! As to the razors for cutting sugar canes (ha! ha!) I wonder if the scribe who threw this piece of composition together ever heard of matches! My own opinion is that somebody has got the drop on the innocent writer of this pretty story."

### FOREIGN.

#### FRANCE.

(Moniteur des Interets Maternels.)

PARIS, Jan. 26, 1883.—Metals.—Business has begun to revive a little, but is, on the whole, still dull, especially in metal quotations of which have, however, undergone no change. We quote, at the close: Copper—Chili Bars, 172 1/2; Ingots and Slabs, 180; Best Selected, 182 1/2; and Pure Copper Ore, 175. Tin—Banco 255 1/2; Billiton 255 1/2; Straits 255 1/2; Australian and English, 255 1/2; Lead, 34 1/2; Zinc, 35 1/2; Spelter, 42 1/2. Iron.—No change has occurred; Merchant still sells in this city at 10 1/2 francs and Flooring iron at 12 1/2 @ 13. The latter papers begin to express the fear that in spite of the large consumption in France, the market may become glutted with iron, the more so as the Government, for financial reasons, will necessarily take less iron and steel than had at first been hastily counted upon. While this is the case, large new works spring up like mushrooms in all directions, at St. Nazaire, Lorient, Valenciennes, &c., whose joint output will swell the amounts available this year notably. In this manner some 300,000 tons extra will be thrown upon the market, while our present productive capacity suffers as it stands. Hence, the only remedy for a partial outlet—at least, for this excess of output—will be extended exportation. This relates to Steel Rails in particular, which will have to be sold very low abroad in order to compete with those of our neighbors, and will therefore entail losses. Another alternative left will be to reduce production, but nobody seems to think of adopting this remedy yet. At Longwy, Pig Iron has, nevertheless, remained steady at 17 francs for Pudding, and 8.25 @ 8.50 No. 3 Foundry. There are in the Longwy district at present 24 blast furnaces in operation and 1 only blown out, while 5 are building. Coal.—While the sale of coal is not active and much of a disappointment, production is pushed vigorously; at the high prices ruling there may be a break down at any moment.

#### BELGIUM.

(Revue Industrielle.)

BRUSSELS, Jan. 25, 1883.—Iron.—We cannot report as yet any appreciable change in the position of the market, nor do we expect any for a couple of weeks to come. During the interval we shall see whether or not our bridge-building concerns and rolling mills will receive orders. We do not, in any event, expect a speedy decline in Pig Iron, of which the stocks are light and makers' brands are unaltered. Of course the rolling mills possessing their own blast furnaces are bet-

ter situated than the rest. Meanwhile, Pig Iron is quite firm. Foundry at 7.50; Pudding at 6.25; and Common do. at 5.25 @ 5.75. Luxembourg is steady at 5.75 @ 6.25. English is weaker at 5.30. Merchant iron does not bring over 13 francs. Sheets range between 8 and 28 francs. The export of Belgian Steel has been during the first 11 months of last year: Ingots, 167 tons, against 276 in 1881; Steel in bars, sheets and Wire, 54,171 against 37,115, and other Wrought, 36.8 against 34.4. Metals have displayed greater liveliness, but there has been no change. We quote: Copper, 176.25; Tin, 246 @ 247; Lead, 3.25; and Spelter 40. Coal has done remarkably well, domestic less so, but in total has partially improved 1/2 @ 1 1/2 ton. If the iron trade were more active, even a greater advance might have occurred; as it is, the demand is active for all other Belgian branches of industry.

#### GERMANY.

##### (Hamburgh.)

HAMBURG, January 25, 1883.—Iron.—Ironmasters are disaffected with the general aspect of German iron trade. Only a small portion of the output has been disposed of till spring; consumers do not feel the effect of curtailed production, for they have replenished their stocks before such reduction was resolved upon. The prices asked for Pudding Pig are not readily subscribed to, rolling-mill owners being in hopes of buying cheaper in England, but the price would have to decline still further in that country before they can do so. On the other hand, Spiegel and Foundry Pig sell with ease at firm rates. Fresh orders for Merchant Iron and Sheets, as well as all other rolling-mill products, are seasonally received at present, while the old ones will soon all be filled. Small works feel this absence of new business very much. Steel works continue busy. The export of Steel Rails from Germany during the first 11 months of 1882 has been 10,000 tons, and the import only 3,000. At Breslau an adjudication of 30 railroad cars and 200 mounted axes has come off, at which the Hoerde, Bolun, Koang and Laura Co. competed and at Magdeburg a maker of Cast Steel was adjudicated 25 cars, and the Bochum Company secured the furnishing of 200 mounted axes; finally, at Hannover, 105 cars were secured on various tenders. Since the beginning of the year no change has occurred in prices. *Metals*.—Lead has remained unaltered at 15.75 @ 16 marks @ 50 kg. for English Pig; German 14.50 @ 15; Copper has looked up somewhat; the range remains 75 @ 80; Tin is firm at 104 @ 105, and Spelter inactive at 17 @ 17.25.

##### (Cologne Gazette.)

DUSSELDORF, Jan. 25, 1883.—Iron.—Only a hand-to-mouth business has been transacted in Pig since our last report; the demand for finished being slack and the price of Pig high, out of proportion on comparing it with what finished has to sell for during these dull times. The only branch really active and fairly prosperous is the Rail-and-Material one. Meanwhile Coal and Coke are as firm as ever. We quote at the close: Prime Spiegel, 72 @ 77 marks @ ton; White Pig No. 1, 62; Luxembourg, 46; Charcoal Pig, 84; Foundry No. 1, 60 @ 75; English No. 1, at Ruhrort, 6.75; Bessemer do. at port of shipment, 4; German do., 6.50; Merchant, 14 @ 15, and Sheets, 175 @ 220.

#### HOLLAND.

##### (Koch & Vletterbo.)

ROTTERDAM, Jan. 27, 1883.—Tin.—The market has been quiet, without fluctuations, at 57 guilders @ kg. Banca, 56 @ 55.25 Billiton, spot, and 57.75 April-May delivery. The market closes firmer on the lowering of the discount in London. The concession to work the Billiton mines was originally given to Prince Henry of the Netherlands, in 1852, for 20 years. A company on shares was formed under this grant, which at first paid no dividends, but later on became a most paying concern, the shares rising 500%. Now the King of the Netherlands want to extend the grant all the way to the year 1907. As this involves, however, a profit of at least 750,000 guilders between now and the year named, the Chamber of Deputies is opposed to this scheme of renewal or prolongation 10 years before it expires, while so far the Government persists in the matter is to end cannot at the present moment be foreseen.

#### EAST INDIES.

##### (Giffen, Wood & Co.)

SINGAPORE, Dec. 21, 1882.—Tin.—The market has been without animation and prices have declined, touching \$3.37 1/2 per picul some days ago, and closing at \$3.40 per picul, sellers, but no buyers. Purchases are under 200 tons, and shipments to the United States so far this month are small. *Tonnage*.—There are a number of disengaged vessels in harbor, and rates are weak. We quote deadweight to London 22/6. For New York 20/0 new business has been done. The *Scorpio* is full, and the *Fannie M.* has arrived and taken up her engagement. F. F. Boston, the *Hooley* has arrived, and is now loading. *Exchange*, after touching 1/8 for 6 months' sight credit drafts on London, has fallen and closes at 2 1/4. The *Ox* finished took for New York 750 piculs Tin, making total shipments to date 105,638 piculs.

### The Scotch Shipbuilding Trade in 1882.

A few weeks since we had occasion to briefly refer to the shipbuilding trade of Scotland during the year 1882, and more particularly during the month of November, and though our remarks at that time were well calculated to give a fair idea of the prosperity of the industry considered, the following interesting supplement will undoubtedly meet with favor. As stated by the *Glasgow Herald*, the returns, submitted below, of the number of vessels and the aggregate amount of tonnage launched by the various firms on the River Clyde reveal an exceedingly healthy state of matters. The builders are said to have surpassed all their previous efforts, and have turned out an amount of new tonnage greatly in excess of the figures for 1881, which were considered at the time to be unusually large. The returns are 50,012 tons above those for 1881, while they are actually 120,500 tons in excess of the returns for 1874, the year which was for some time considered as the greatest in the history of the trade. The returns for the past two years have given proof that the depression which prevailed a few years ago was not due to lack of enterprise or falling off in technical skill on the part of the Clyde builders, but was caused by inactivity among the ocean-carrying companies of the world. Notwithstanding the immense quantity of new tonnage put into the water during the year, the amount of work on hand is very substantial. Many of the firms have more tonnage on hand than they launched during 1882, and consequently their prospects are good, while, in the great majority of cases, the new year opened with well-filled stocks.

There were launched during the year by the various firms engaged in shipbuilding on the Clyde 291 vessels, of an aggregate tonnage of 391,934 tons, against 261 vessels and 341,022 tons during 1881. The exact bearing of the returns will, however, be seen by reference to the following table, which gives the amount of tonnage launched during each year since 1870:

Year.	Tonnage.	Year.	Tonnage.
1870	301,324	1875	211,324
1871	301,324	1876	211,324
1872	301,324	1877	211,324
1873	301,324	1878	211,324
1874	301,324	1879	211,324
1875	301,324	1880	211,324
1876	301,324	1881	211,324
1877	301,324	1882	211,324
1878	301,324		
1879	301,324		
1880	301,324		
1881	301,324		
1882	301,324		

The use of steel in the construction of vessels has been steadily on the increase, and it is gratifying to see the ideas of naval architects so generally adopted by ship-owners. At first the new material was received with caution, but now the majority of large steamers are built of it. On the Clyde it has had a very favorable reception, and the tonnage of steel-built vessels has been going up by leaps and bounds. In 1879 the steel-built vessels amounted to 18,000 tons, in 1880 they rose to 42,000 tons, and in 1881 to 66,609 tons. The latter figures have been far surpassed during the past year, the steel vessels numbering 60, of an aggregate tonnage of 108,254 tons. While the use of steel is on the increase, wood has been steadily declining, and in the returns which have been received only two small vessels are marked as having been built of wood.

While the Clyde builders are chiefly occupied in the construction of high-class vessels, their work is of a very varied character, and embraces every form of floating craft, from a simple lighter to a complex, highly-finished Atlantic passenger steamer. The returns show the wide variety of work accomplished on the river. The 291 vessels launched by all the firms on the Clyde were made up as follows: 172 screw steamers, 37 sailing ships, 14 paddle steamers, 8 yachts, 21 barges, 5 barks, 2 war ships, 2 hopper barges, 5 screw tugs, 10 steam launches, 4 lighters, 8 dredgers and 3 cargo flats. The River Tyne, it appears, has a monopoly of tugs, and the East Coast of England devotes its energies to cargo-carrying boats, but on the Clyde every form of vessel is constructed. From a general abstract of the trade on the Clyde for the year 1882 we find that the total number of vessels constructed was 291, while the amount of tonnage, as indicated in the table given above, was 391,934 tons. It will be seen that a notable increase has taken place with almost every succeeding year, and the future, it is thought, will yield still more gratifying results.

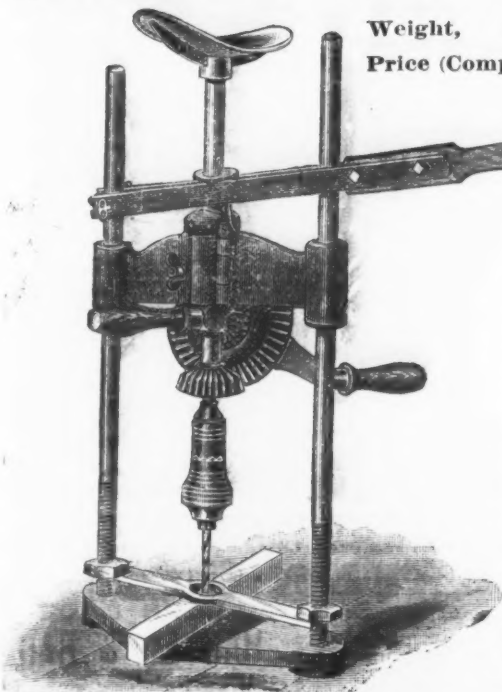
Some men, especially mechanics, never seem to be able to learn the lesson that a slow machine is often cheaper than a fast man. The other day, when talking with a very expert machinist in regard to a certain job of work—we forget now just what it was—he said that he could do it in 15 or 20 minutes any time, and in about half the time which it would take the ordinary machine to perform the same job, but he forgot that he is worth about \$4 per day, while the machine and the boy to run it is probably not worth more than half as much. The complaint is often heard that planer hands, lathe hands, drill-press hands and special-tool men are driving out the good and expensive machinists; that the boy learns to run a drill press, and so takes the bread and butter out of the mouths of men who not only know how to handle a drill press, but make it, as well, if necessity comes. The fact is forgotten that when the drill press is simplified so that a boy can do a certain class of work on it, a great many extra boys and drill presses can be employed doing work which it would never pay to do if the first-class machinist had to furnish the labor. The machinery in such cases lifts boy and machinist together. The man that has the brains is taken where his brains and skill are of the most value, and the day laborer finds himself in a better position than before. Instead of turning a crank to furnish power, as was the fashion years ago, he has advanced several steps, and is perhaps at a drill press or an emery-wheel, or doing a class of work considerably more valuable than that which he would have had in the last generation.

The controversy between Mr. Shinn and Professor Robinson in regard to the cost of railroad stops, which grew out of Mr. Shinn's paper on that subject, is likely to prove of very great benefit in many ways. It seems hardly settled yet as to how the items of cost of making a stop at a crossing should be regarded. Indeed, the question of what items should be properly included in the account is hardly settled. From some points of view the cost of stopping at a railroad crossing is very great. From others it becomes somewhat insignificant. Some gentlemen in considering the subject have evidently put in expenses which could hardly be included with propriety, while others have reduced the cost until they are evidently below a fair average. We think that before a reasonably accurate account can be made up, several items in regard to wear of wheels must be kept with greater accuracy than at the present time. It would seem to an outsider that the mileage of a wheel which never has a brake-shoe on it, as compared with one subjected to the work of the brake, ought to be ascertained. The deciding of these points, however, will be made comparatively easy by the discussion, and we hope none of the gentlemen who have taken part in it will forget that the ultimate object is not so much the vindicating of any special view of the matter, as in ascertaining a fair method of estimating.

Since Mr. Emery's experiment years ago with non-conducting cylinders, very little seems to have been done toward ascertaining whether a cylinder for a steam engine can be made with walls having a non-conducting material, or at least a non-conducting lining. While the difficulties of producing such a lining are very great, there seem to be no great obstacles in the way of lining the heads and both sides of the piston with some material which shall fulfill the conditions repeatedly pointed out by Mr. Emery, Professor Thurston and many other well-known engineers. It seems probable that the form of carbon obtained on the surface of a casting when left for a long time in the ordinary cleaning pickle would very much reduce cylinder condensation if the piston and cylinder heads could be protected with it. To do this, of course, would be an easy matter. For experimental purposes we suppose a cylinder lined with wood could be used long enough on an ordinary engine to find out how great a saving could be made in actual practice. If anything like the experimental figures obtained by Mr. Emery were realized, there would be an enormous inducement to discover some suitable material for the purpose.



# MOUNTED BREAST DRILL.



Weight, - - - 13 Pounds.  
Price (Complete), - - - \$6.

This is one of our best Breast Drills, mounted in a steel frame. The upright rods of the frame are 5/8 round steel, 16 inches high and 8 inches apart. As seen in the cut, the drill is held true by the frame, and the work held firmly in place by the clamp. The lever feed is operated by hand, or a weight may be used. The Drill Stock is of 5/8 round steel, heavily Nickel Plated. The gears are cut, and are changeable from even to a speed of three to one, as may be desired. The handles are rosewood. The jaws of the chuck are forged steel, and will hold any size or shape shank, round, square or flat. We also put in an extra set of steel jaws for small round drills only.

The Drill Stock can be put in or out of the frame by the half-turn of a thumb-nut. This is the most beautiful and useful tool which has been put on the market for many years.

**MILLERS FALLS COMPANY,**  
74 Chambers Street, New York.

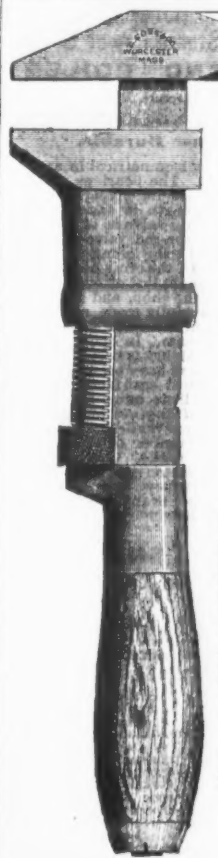
# A. E. DEITZ,

(Successor to Barnes & Deitz.)



**DURRIE & McCARTY, Agents,**  
97 Chambers & 81 Reade Sts., New York.

**H.B. SMITH MACHINE CO.**  
925 MARKET ST.  
PHILADELPHIA  
CELEBRATED  
**WOOD WORKING MACHINERY**  
For Car Shops, Planing Mills, &c.  
Also Machinery for all purposes. Correspond with us.



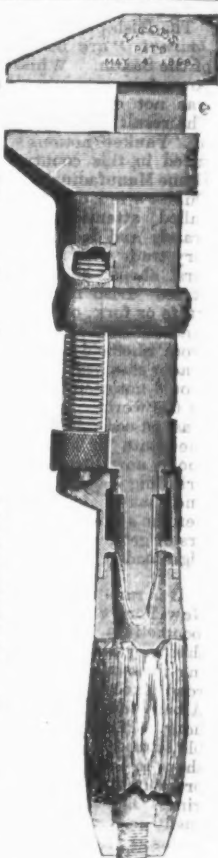
# L. COES' PATENT Screw Wrenches

MANUFACTURED BY  
**L. COES & CO.,**  
Worcester, Mass.  
ESTABLISHED IN 1839.



Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearing, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped.

**L. COES & CO.,**  
Worcester, Mass.  
Warehouse,  
97 Chambers and 81 Reade Sts  
NEW YORK.  
**DURRIE & McCARTY,**  
Sole Agents.



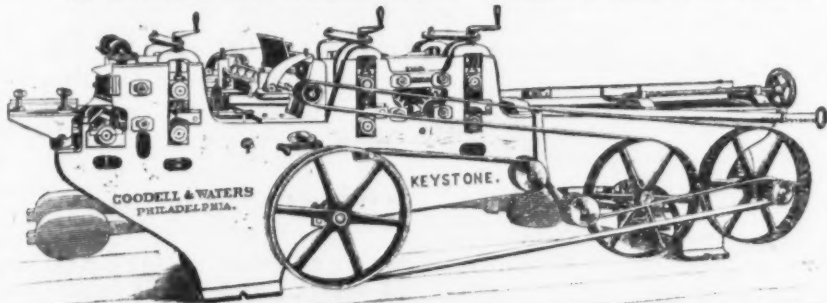
## CHAMPLAIN Forged Horse Nails.

MANUFACTURED BY THE  
**NATIONAL HORSE NAIL CO.,**  
Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.

WAREHOUSE  
97 CHAMBERS AND 81 READE STREETS. NEW YORK.  
**DURRIE & McCARTY, Sole Agents.**

## WOOD-WORKING MACHINERY.



Keystone Rapid Feeding Floorer. Machinery for Planing Mills, Railroad Shops, Car Builders, Cabinet, Carriage, Sash, Door and Blind Makers.

SEND FOR NEW CATALOGUE.  
**GOODSELL & WATERS,**  
31st and Chestnut Streets, - - PHILADELPHIA, PA.

## NORTH BROTHERS,

23d & Race Sts., PHILADELPHIA, PA.,  
HARDWARE MANUFACTURERS.  
LIGHT CASTINGS A SPECIALTY.  
THE HENRY B. NEWHALL CO., 105 Chambers St., New York Agents.

SOLE MANUFACTURERS OF THE  
"WEED IMPROVED" BORING FAUCET.  
For Molasses, Oil, Japan, Varnish, &c.

## UNQUESTIONABLY THE BEST LEMON SQUEEZERS

IN THE MARKET ARE THE Nos. 1, 2 and 3 "King" for FAMILY, RESTAURANT AND HOTEL USE.  
Send for descriptive circulars.

**KYSER & REX,**  
(Variety Iron Works)  
Manufacturers of  
HARDWARE SPECIALTIES, IRON TOYS, NOVELTIES AND HOUSE FURNISHING HARDWARE.  
MAIN OFFICE AND FACTORY:  
FRANKFORD, Philadelphia.

EXTRA HEAVY GLASS BOWL.

BRANCH OFFICE:  
11 North Fourth St., Philadelphia.

## RIVETS. ALL KINDS OF RIVETS. CLARK & COWLES,

PLAINVILLE, CONN.

## QUAKER CITY LAWN MOWER.

Guaranteed Superior to any other Center Cut MOWER ON THE MARKET.

THE QUAKER CITY Reduced in Price. Now, why buy a worthless mower? SEND FOR LIST.  
**Lloyd, Supplee & Walton,**  
Philadelphia.  
**DURRIE & McCARTY,**  
New York.

## THE FORSYTH SCALE CO., YOUNGSTOWN, O.,

Manufacture a full line of  
**FORSYTH'S STANDARD SCALES**  
Counter, Portable, Dormant, Stock and Hay, and R. R. Track SCALES.

Call Special Attention to their  
**SUSPENSION HAY & R. R. TRACK SCALES.**

Also, Warehouse Trucks and Letter Presses.  
PRINCIPAL WAREHOUSES:  
**FORSYTH SCALE CO., Chicago;**  
**SIMMONS HARDWARE CO. St. Louis.**

**PRIZE MEDALLISTS:**  
Exhibitions of 1862, 1865, 1867, 1872, 1873, and only award and medal for Noiseless Steel Shutters at Philadelphia, 1876; Paris, 1875, and Melbourne, 1881.

## CLARK, BUNNETT & CO., LIMITED,

Late CLARK & COMPANY,  
Original Inventors and Sole Patentees of  
Noiseless Self-Coiling Revolving STEEL SHUTTERS,  
FIRE AND BURGLAR PROOF. ALSO IMPROVED ROLLING WOOD SHUTTERS,  
Of various kinds. And Patent METALLIC VENETIAN BLINDS.

Endorsed by the  
Leading Architects of the World.  
Send for Catalogue.

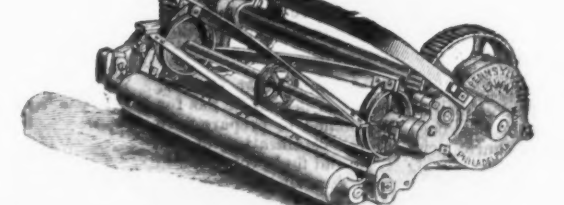
Office and Manufactory,  
162 & 164 West 27th St., N. Y.

## TINIUS OLSEN & CO., STANDARD SCALES AND Testing Machines.

Manufacturers of all descriptions of Testing Machines. Tests made daily.  
Office and Works, N. W. cor. 19th and Buttonwood Sts., Philadelphia.

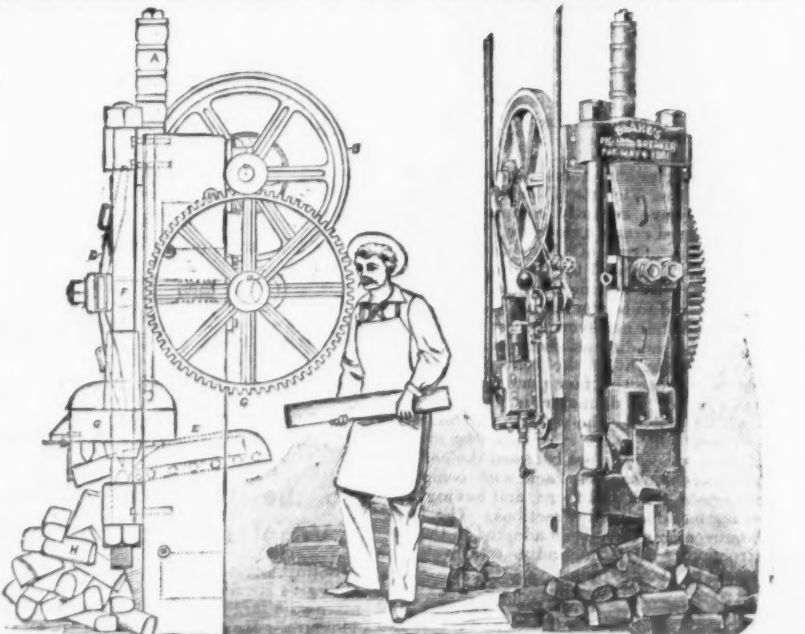
## 1883. PENNSYLVANIA LAWN MOWER.

Has no Equal. Surpassing all others, and pronounced "THE BEST."



For descriptive catalogue and prices write to  
**LLOYD, SUPPLEE & WALTON, Philadelphia.**  
**DURRIE & McCARTY, New York.**  
**AMES PLOW CO., Boston, Mass.**  
**PRATT & CO., Buffalo, N. Y.**  
**SIMMONS HARDWARE CO., St. Louis, Mo.**  
**HAMILTON & MATTHEWS, Rochester, N. Y.**  
**MARKLEY, ALLING & CO., Chicago, Ill.**  
**HUNTINGTON, HOPKINS & CO., Sacramento and San Francisco, Cal.**  
**CUTLER, HOLDREGE & CO., Peoria, Ill.**  
**DUCHARME, FLETCHER & CO., Detroit, Mich.**  
**LOCKWOOD, VANDORN & TAYLOR, Cleveland, Wis.**  
**WM. FRANKFURTH & CO., Milwaukee, Wis.**  
**WALTER S. LUDLOW, Cincinnati, Ohio.**  
**LLOYD & CLARKE, La Crosse, Wis.**  
**H. MITCHELL & CO., Columbus, Ohio.**

## BLAKE'S PAT. PIC IRON BREAKER.



A new and successful machine for breaking pig iron into any length desired, with rapidity and economy. Besides saving in cost of breaking by hand, it secures the greatest economy in melting. Several machines already in use. Every machine guaranteed against breakage of parts. Requires but three horse-power. Can be run by belt or have small engine attached.  
Send for Circulars, Prices, &c.

**BLAKE CRUSHER COMPANY,**  
Sole Makers, 85 Orange Street, NEW HAVEN, CONN.

In addition to our **PERFECT COMB**, which is to day in the hands of a majority of the jobbing trade throughout the United States and Canada, there having been of late a growing demand for a Curry Comb cheaper than the Perfect, and better than the ordinary styles offered in the market, we have decided to maintain the position we have always occupied as pioneers in every advance made in the manufacture of Curry Combs. To this end we have produced and now offer to the public, in connection with the various styles of the Perfect, the **PIONEER**, which we believe will meet all the requirements of the case, and from prices in catalogue a very liberal discount will be made to the trade.

Our improved  
**PATENT BORING MACHINE,**  
with our improved adjustable crank, by which a greater or less leverage is obtained, enables us to offer a machine that will perform its work with less labor than any machine heretofore placed on the market.

**LAWRENCE CURRY COMB CO., 309 East 22d St., New York City.**



**Sharp Tricks in the Cutlery Trade.**—“The Irish people,” says the *British Trade Journal*, “are finding out the trade tricks of the Saxon. While the Land League was powerful, nothing would sell in Ireland which was not of American or Irish production. The result was that many a hundredweight of ‘Yankee notions’ have been manufactured in this country. A meeting of the Home Manufacturing Association was held at Dublin a few days ago, when a Mr. Briscoe called attention to what he termed the frauds and deceptions practiced in the cutlery trade with regard to Ireland. The cutlery shops, he said, were full of articles styled ‘Irish manufacture,’ whereas not a knife or fork, or even a pen-knife blade, was made in that country. They were brought from Sheffield with the name of the Irish trader stamped upon them; but such a thing would not occur in London or any other city in the world. A strongly-worded resolution was passed: ‘That the association regret the state of the cutlery trade in Dublin, there now being nothing but repairs and grinding carried on by cutlers of Dublin; and that we condemn in the strongest manner the system adopted by Dublin shop keepers of getting their names stamped on foreign-made cutlery.’”

It is rumored in and about Albany that the New York Central people have several fast locomotives under way. Rumor also says that they are intended for hauling 15 drawing-room cars or sleepers over any part of the road, except, of course, the “hill” between Albany and Schenectady, at 60 miles per hour. There is also a report that considerable latitude has been given to the locomotive shops in the way of design, and that a heavy premium has been offered for the best engine. The business part of the scheme is easily enough understood. Fast and heavy trains are to be hauled from Albany to Buffalo and from Albany to New York. The mechanical end of the scheme is one that can be considered from several points of view. The New York Central engines, as at present constructed, perform remarkably good service. Their coal bills are low, and we have the impression that in the matter of repairs, power, &c., they compare favorably with almost anything in the country. Normally, they are overloaded, and the fast trains, once delayed, rarely succeed in making up lost time. From the character of the men in charge of the Central road, and their theoretical and practical knowledge, we judge that something good is to be expected. This would be an excellent chance to try Strong’s new design for a locomotive boiler, for we apprehend that the difficulties to be encountered in designing the new engines will be in the boiler rather than in any other part of the machine.

In the *Zeitschrift für Analytische Chemie*, Tjaden Modemann remarks that he has for some time been accustomed to prepare pure sulphuric acid by recrystallization of the hydrate ( $H_2SO_4 \cdot H_2O$ ), and finds this seldom adopted method of purification to be really an excellent one. The author has experimented in this way upon acids containing considerable quantities of lead and arsenious and nitric acids, &c., and by protracted recrystallization has in all cases obtained a pure acid from them. The method is very simple. The acid is mixed with sufficient water, and in bottles two-thirds full, exposed to the cold in the open air on a frosty night. If the mixture has been properly made, it is generally frozen throughout the next morning. The chief thing, then, is to carefully separate the crystals from the mother liquor, and for this purpose the author employs a centrifugal apparatus, so constructed that the acid only comes in contact with glass. The separation is very easily effected, and, except in cases where an acid is strongly contaminated with the different oxides of nitrogen, one recrystallization is generally sufficient.

According to one of our London contemporaries, the Victoria Foundry, of Leeds, England, have recently completed a large treble-gear crank axle lathe for a marine engineering firm of Marseilles, France, where it will be used for turning cranks and shafts, &c., for marine engines. The lathe is considered to be the largest piece of work of its kind that has ever been constructed in Leeds, and the dimensions given are as follows: The height of the centers above the bed is 5 feet; the face-plate, which is 10 feet 4 inches in diameter, is provided with jaws for gripping the work. The lathe-bed is 9 feet wide, and is sufficiently long to allow a space 34 feet between the centers. There are two saddles, each with compound slide-rests, back and front, and having self-acting motions in all directions. The latest improvements have been adopted in the construction of the lathe, and its total weight is said to be about 90 tons.

The visible assets of the coal and iron firm of Rogers & Co., Chicago, were seized by the sheriff, February 12, on a confession of judgment for \$5000 in favor of R. M. Charrie. The house was one of the oldest in that city, having been established 40 years ago. The failure is attributed to the fact that the firm indorsed paper of the suspended Union Iron and Steel Company to the extent of \$80,000. The firm decline to make a statement. Their liabilities are estimated at \$125,000.

**Newark Hardware Works,**  
60, 62 & 64 N. J. R. AVENUE,  
NEWARK, NEW JERSEY.



**STEEL PIVOT SCALES**  
WITH  
**PATENT SEAMLESS SCOOPS.**  
(MADE OF ONE PIECE OF METAL.)

Delivered free on steamer or cars in New York City. Liberal discount to the Trade. Price List on application.

**Philadelphia Branch House of The New York Safety Steam Power Co.**

**ENGINES AND BOILERS**  
Of all sizes, from 1 to 100 H. P., on hand.

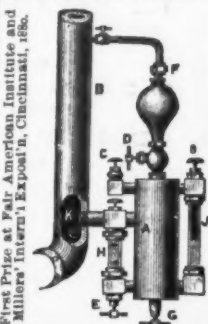
**They are Popular because Reliable. Cheap because Durable.**

These Engines are very symmetrical in appearance and finely finished. The bearings are long and the shafts of large diameter, giving both large area of bearings and strength in excess of any reasonable duty. The main valve is of the plain slide description. The piston-rod, valve-rod, cross-head pin, &c., are of steel; the crank-pin box is of composition, babitted; the cross-head pin box is of brass. A critical steam test of every engine is made before it leaves the shop, and the necessary adjustments are carefully made, so that the machine is all ready to run the moment it is placed in position and given steam. In operation they are noiseless. Their durability is best attested by the fact that many of them have been at work for twelve years giving utmost satisfaction to their owners, and having cost little or nothing for repairs. Eighteen hundred Engines of our manufacture are in use, and whenever desired, reference will be made to a great number of either of the several sizes which we make. Correspondence solicited, and engineering advice given to purchasers. Large stock of new and second-hand Machinery on hand. Also Branch House for the sale of the Sturtevant Blowers. Catalogues and prices sent to any address.

**HENRY I. SNELL,**

135 North Third St., PHILA., PA.

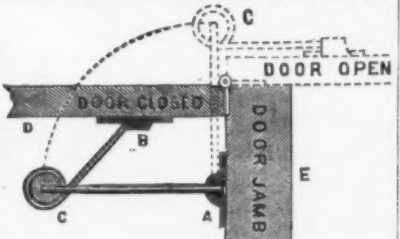
**THE DETROIT LUBRICATOR CO.'S**  
CONTINUOUS FEED  
**LUBRICATOR CUPS,**



for oiling valves and cylinders of steam engines by the only perfect method, through the steam pipe. The oil passes in sight, drop by drop, into the column of steam, where it vaporizes, thus becoming a steam lubricant, oiling perfectly every part reached by the steam. Any clean oil, black or white, light or heavy, may be used. Saves from 10 to 50 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to you on trial for ten days' trial if desired. In ordering, give diameter of cylinder.

**DETROIT LUBRICATOR CO.,**  
Office, 129 GRISWOLD ST., Detroit, Mich.  
Mention The Iron Age.

**DEVORE'S DOOR SPRING.**



Cheapest, best and most convenient, easily put on, simplest in construction, and most durable. It is uniform tension; holds door firmly when closed, and when the door is opened about 120 degrees of a circle, the force of the spring is reversed, and will hold the door open; combining more valuable features than any other spring in the market, and at a price to meet the wants of the Trade. Our Spring has been on the market for two years and sold by the principal jobbers and dealers in hardware in the Western States, and has given universal satisfaction. With improved and increased manufacturing facilities we are enabled to supply the trade at reduced prices for 1883. Sample Springs can be seen at our prominent Jobbing Houses in the United States. MANUFACTURED BY **L. M. DEVORE, Freeport, Illinois.** C. WIGHT & SON, Dayton, Ohio.

**FEED WATER HEATERS.**

The Best and Cheapest in the Market.

Warranted to heat water by exhaust steam from 206° to 212° Fahrenheit.

FOR DESCRIPTION AND PRICE APPLY TO  
**THE NATIONAL PIPE BENDING CO.,**  
NEW HAVEN, CONN.

**NOTICE.**

To the Hardware Trade,  
Wholesale and Retail.

Before buying, send me for quotations. Will give special figures lower than market rates on a large line of Shelf Hardware and Tinware. Have also an immense stock of special job lots in which I can give decided bargains.

**A. W. WHEELER,**  
141 Lake Street, CHICAGO.

**T. NEW'S**  
PREPARED

**ROOFING**

For steep or flat roof. Applied by ordinary workmen at one-third the cost of tin. Circulars and samples free.

**T. NEW, 39 John St., New York.**  
BARRETT, ARNOLD & KIMBALL, Western Agents, Chicago, Ill.

**J. W. Gallaudet**  
& Co.

Cor. Broadway and Wall St., New York. Bankers and dealers in COMMERCIAL PAPER, Stocks and Bonds dealt in for cash or on margin at New York Stock Exchange.

**Wiley & Russell Mfg. Co.,**

GREENFIELD, MASS.

**Lightning Screw Cutting Machinery and Tools.**

Bolt Cutters for hand or power. The celebrated Lightning Screw Plates, cutting from wire sizes to 1½.

Pipe Taps and Dies.

Taps, Dies and Reamers for use in the Bit Brace.

Tire Wheels, Tire Bolt Wrenches, Nut Wrenches.

Green River Tire Upsetters.

Green River Tire Benders.

**Lightning Punching Press.**



Send for Illustrated Price List.



**THE JENKINS STANDARD PACKING** is acknowledged by users as the Best in the world. Unlike all other Packings, the Jenkins Standard Packing can be made any thickness desired in a joint by placing two or as many thicknesses together as desired, and following up joint it vulcanizes in place and becomes a metal of itself (it is frequently called Jenkins Metal) and will last for years, as it does not rot or burn out. Avoid all imitations, as a good article is always subject to cheap imitations. The genuine Standard Packing is stamped on every sheet, "Jenkins Standard Packing," and is for sale by the Trade generally. Manufactured only by

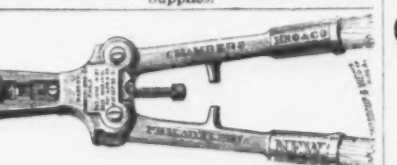
**JENKINS BROS.,**  
PROPRIETORS JENKINS PATENT VALVES, PACKING, &C.  
71 JOHN ST., NEW YORK.  
79 KILBY ST., BOSTON.

**FRASSE & CO.,**  
62 Chatham St., New York.



IMPORTERS OF  
**CHESTERMAN'S TAPES, RULES, &c.,**  
Stubs' Files, Tools and Steel Wire,  
GROHET SWISS FILES.

Manufacturers and Dealers in Machinists' Tools and Supplies.



**BOLT & RIVET CLIPPERS.**

For cutting off the ends of Bolts and Rivets, on carriages, wagons, harness, etc. Ask for them where you buy your hardware, or send for circular and price list.

**CHAMBERS, BROTHER & CO.,**  
52d St., below Lancaster Ave.,  
Philadelphia, Pa.

**HAMMOND'S Window Springs**

Lock and support upper and lower sashes—all sizes. Are very convenient, simple and durable. Sample to the Trade free.

**W. S. HAMMOND,**  
Lewisberry, York Co., Pa.  
Circulars give full instructions.

**MARTIN REYNOLDS,**  
354 Lorimer St., Brooklyn, E. D.

**Brass Smelter & Refiner.**  
Ingot Brass for Car Bearings a specialty.  
Brass washings for bell makers always on hand.

**LOWE'S METALLIC PAINT CO.,**

CHATTANOOGA, TENN.,

OFFER TO CONSUMERS

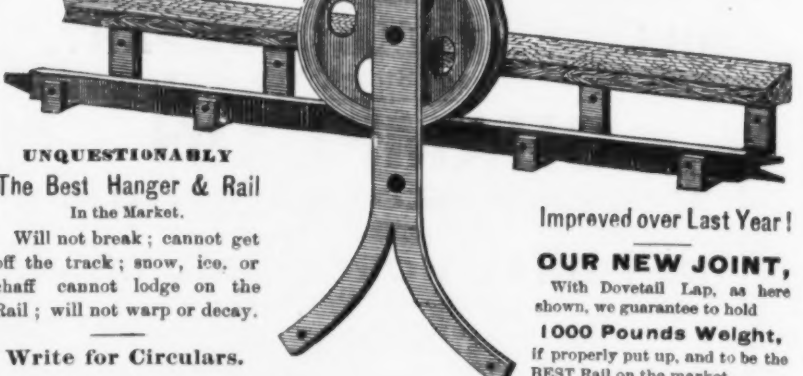
**THE BEST METALLIC PAINT MANUFACTURED IN THE UNITED STATES.**



We have OVER 1000 CERTIFICATES from Railroad Officers, Wagon and Agricultural Implement Makers, Car Builders, Tin and Sheet Iron Roofers, Wrought Iron Bridge Companies and Blast Furnaces. We guarantee IT TAKES 25 PER CENT. LESS OIL, has more body and better covering properties than any other metallic paint.

For sale by the principal paint dealers and hardware merchants in the United States.

**Terry's Wrought Iron BARN DOOR HANGER & RAIL.**



**TERRY MFG. CO.,**  
DUNDEE, N. Y.

**J. W. WILLIAMS & SON,**

CHAGRIN FALLS, OHIO,  
MANUFACTURERS OF

"THE WILLIAMS"

AND

"WESTERN or D. V."

PATTERNS OF

**SEAMLESS WAGON SKEINS.**

Will get up Special Patterns for large Wagon Manufacturers.

Send for Catalogue and Discount Sheet.

**THE HANGCOCK INSPIRATOR.**

The best Feeder known for Stationary, Marine and Locomotive Boilers.

**REQUIRES NO OILING.**

Consumes Less Steam Than Any Other Boiler Feeder.

**FAIRBANKS & CO.**

311 Broadway, NEW YORK.

**GROOME, ROBERTS & CO.,**

(FORMERLY OF J. F. BAILEY & CO.),  
**IRON AND STEEL COMMISSION,**

216 South Fourth Street, PHILADELPHIA.

Beams, Channels, Angles, Sheared and Universal Plates, Car Axles, &c.

**BRIDGE SPECIFICATIONS A SPECIALTY.**

**J. HAISH & CO.,**

SOLE MANUFACTURERS OF  
**THE RATTLER.**

Haish's S Barb Steel Fence Wire, the Pioneer and Duplex Galvanized and Enameled; barbs locked on both wires, and possesses more excellent quality than any fence ever produced. We also call your attention to the Jacob Haish Wire Fence Stretcher, Double Crank, Double Hope, Center Draft, and offered to the public as the best device in the world for stretching wire fences. Every Stretcher guaranteed to do perfect work or no sale. Send for sample and price list. Liberal discount to jobbers.

**MALLEABLE IRON CASTINGS**  
TO ORDER.

Air Furnace Process. Quality Guaranteed. Send for Estimate.  
**SPECIALTIES IN SADDLERY and WAGON HARDWARE,**  
**YOUNGSTOWN MALLEABLE IRON COMPANY, Youngstown, Ohio.**



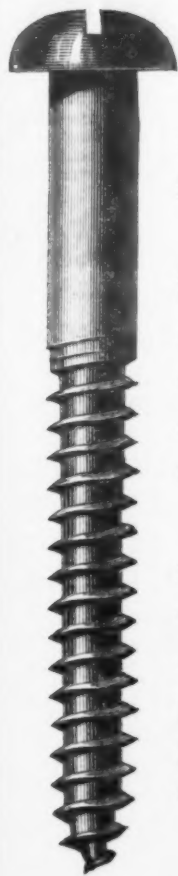
**PHILADELPHIA SCREW CO., Limited**

Twelfth and Buttonwood Sts., PHILADELPHIA,

MANUFACTURERS OF

**IRON AND BRASS WOOD SCREWS**

OF EVERY DESCRIPTION.



Quality, finish and tests as to strength guaranteed equal to any in the market.

Desiring to give the fullest advantage to our customers, we have withdrawn all our accounts from Commission Houses, and solicit direct correspondence from Dealers in all parts of the country.

Having placed an additional 100 Horse-Power Engine, and with otherwise improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts.



A FULL LINE IN STOCK.

**IMPERIAL WATER COOLERS.**

SEVEN SIZES.

Three Grades,

A, B AND C SERIES.

Manufactured by

George D. Winchell

Mfg. Co.,

123 WALNUT ST.,

Cincinnati, Ohio.

Send for Catalogue.

**MELLERT FOUNDRY & MACHINE CO., LIMITED.**

(Works Established at Reading, Pa., in 1848.)

MANUFACTURERS OF



Also Flange Pipe, for Steam or Water, of all sizes used. Special Castings, such as Branches, Bends, Reducers, Sleeves, &c. Stop Valves, Fire Hydrants, Retorts, Lamp Posts, &c.

The Improved Canada Turbine Water Wheel.

MACHINERY AND CASTINGS FOR

Furnaces, Rolling Mills, Mining Pumps, Hoists, &amp;c.

CAR CASTINGS, GIRDERS, COLUMNS, BRACKETS, IRON RAILING, &amp;c., &amp;c.

GENERAL OFFICE AT READING, PA.

**OLD DOMINION****CUT NAILS, BAR IRON.**

Address R. E. BLANKENSHIP,

RICHMOND, VA.

**SOUND DEADENED**

IN FLOORS AND WALLS OF

FACTORIES,

STORES,

AND DWELLINGS,

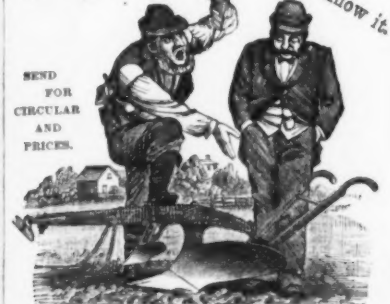
By the Fire-Proof Material Called Mineral Wool.

The POOREST CONDUCTOR of heat yet offered. CHEAP and DURABLE. Sample and circular free by mail.

U. S. MINERAL WOOL CO.,

22 Cortlandt St., New York.

No Sir! You can't GIVE me your Plow! I have tried them all, and wouldn't give the IMPERIAL for all the Plows I ever saw. I tell you, sir, it is THE BEST PLOW IN THE WORLD No Mistake! and You know it.

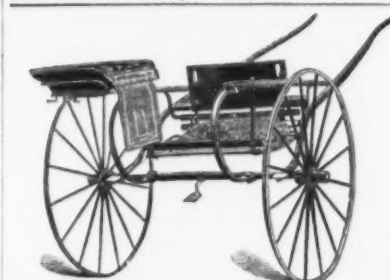


BUEHNER, GIBBS &amp; CO.

Manufacturers of

Gibbs Imperial &amp; Ohio Chilled Plows

CANTON, O. GENERAL AGENTS:—N. B. &amp; W. D. Berryman, Baltimore, Md.; Graham, Emien &amp; Passmore, Phila., Pa.; Scoble, Parker &amp; Hanson, Pittsburgh, Pa.; L. G. Sherman &amp; Co., Providence, R. I.; E. A. Almond, Indianapolis, Ind.



PATENTED.  
C-SPRING CART CO.,  
RUSHVILLE, IND.

We are making a Road Cart that is strong, light, easy on the horse and rides as easy as a buggy. Easy to get in and out of. Cut shows No. 3, with seat swung back ready to enter. Write for catalogue and prices.

**PATENT PORTABLE Cylinder Boring Machine.**

For boring all makes and sizes of steam and blast cylinders, pumps, Corliss valves, steam hammers and blowing engines, in their present position.

L. B. FLANDERS MACHINE WORKS,  
1025 Hamilton Street,  
PHILADELPHIA, PA.

**TACK & NAIL MACHINERY.**

Parties desiring to contract for Tack and Nail Machinery of the MOST IMPROVED PATTERNS are invited to correspond with

BOX 135, MILFORD, MASS.

Have had 20 years' experience in building all kinds of machinery connected with the business, and 7 years' experience in operating the same; and have a new and complete system for manufacturing Tacks and Nails to impart to parties who wish to engage in the business on an extensive scale.

Chance to Purchase Improved Tack and Nail Machinery.

NELLIS, McINTIRE & CO.  
PITTSBURGH, PA.  
Manufacturers Nellis' Electric Spring Agitators, For Cultivators, Harrows, Seeders and Smoothing Harrows.  
Nellis' Original Harpoon Horse Hay Fork, Nellis' Grapple and Wood Wheel Pulleys, Nellis' Cast Tool Steel Castings, Nellis' Ornamental Fendings, Rollings and Castings, Agricultural Gears of all kinds, Crucible Cast, Iron Casters, and Open Hearth Steels, For Angers and Diggers, &c.

**THE "EDDY" STRAIGHTWAY VALVES.**

ALSO

FIRE HYDRANTS.

Axe, Hatchet, Powder and

Brush Machinery.

THE EDDY VALVE COMPANY,

WATERFORD, N. Y.

AGENTS IN ALL PRINCIPAL CITIES.

Send for Price List.

**PROVIDENCE TOOL CO.,**

MANUFACTURERS OF

**Finished Case-Hardened Hexagon Nuts**

Of Uniform Size, and Tapped to U. S. Government Standard.

**MACHINERY NUTS,**

CHAMFERED AND TRIMMED WITH DRILLED HOLES.

**TURN BUCKLES**

Of Superior Workmanship and Extra Quality Iron.

**SMALL DROP FORGINGS MADE TO ORDER.**

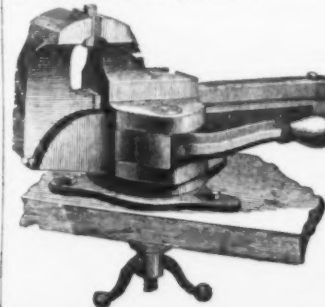
PROVIDENCE, R. I.

REPRESENTED BY

H. B. NEWHALL CO., No. 105 Chambers Street, New York.

J. H. WORK, Nos. 13 and 15 Pearl Street, Boston, Mass.

S. H. &amp; E. Y. MOORE, Nos. 163 and 165 Lake St., Chicago, Ill.

**STEPHENS PATENT****VISE.**

50 PER CENT. of time and labor saved by every mechanic using this solid, quick-working Vise. Strongest and most durable of any Vise in the market. Has the latest improved taper, pipe, and other attachments.

For Sale by the Trade.

Office, 41 Dey Street, New York, U. S. A.

**PHILADELPHIA SMELTING COMPANY, Limited,**

S. E. Cor. Twelfth and Noble Sts., PHILADELPHIA.

GENUINE BABBITT, Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

Office JAMES BUTTERWORTH & SON, Manufacturers of Woolen Machinery, 262, 264 and 266 E. Adams St., PHILADELPHIA, October 17, 1881.  
PHILADELPHIA SMELTING COMPANY.—GENTLEMEN: We have been running your "Genuine Babbitt" on our wood drilling machine for the last eight years at a speed of 900 revolutions per minute, without renewal. We have found it to be the best metal we ever used.  
Yours truly, JAMES BUTTERWORTH & SON.

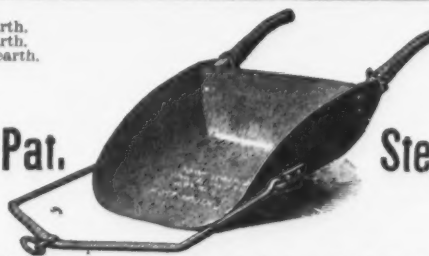
**DEOXIDIZED BRONZE,**

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

PHILADELPHIA SMELTING COMPANY, City.—GENTLEMEN: After a trial of eighteen months of your "Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.  
Very truly, HENRY DISTON & SONS.

No. 1 Carries 7 feet earth.  
No. 2 Carries 5 feet earth.  
No. 3 Carries 3½ feet earth.

PATENTED  
December 17th, 1881.

**The York Pat.****Steel Scraper.**

The Lightest and Strongest Scraper made. The body is made of one single piece of steel. The Handles are fastened inside of fold, and free from all obstructions. The body, bail and runners are all made of steel. Especially suited for contractors. Send for circulars. Manufactured by

THE YORK MFG. CO., Limited, Portsmouth, Ohio.

W. W. SCRANTON,

President.

WALTER SCRANTON,

Vice-President.

E. P. KINGSBURY,

Sec'y and Treas.

**THE SCRANTON STEEL COMPANY,**

MANUFACTURERS OF

**STEEL RAILS & BILLETS.**

Works at Scranton, Pa.

New York Office, - - - 56 Broadway.

**G. W. Bradley's Edge Tools.**

Butchers' Cleavers,  
Butchers' Choppers,  
Axes and Hatchets,  
Grub Hoes and Mattocks,  
Mill Picks,  
Box Chisels and Scrapers,

Ring Bush Hooks,  
Ax Eye Bush Hooks,  
Socket Bush Hooks,  
Watt's Ship Carpenters' Tools,  
Carpenters' Drawing Knives,  
Coopers' and Turpentine Tools.

FOR SALE BY

MARTIN DOSCHER, Agent, 85 Chambers Street, N. Y.

**CLEVELAND FLUE CLEANER MANUFACTURING CO.,**

The most simple, durable  
and economical  
steam flue cleaner.



It saves  
from 15 to 25 per cent.  
in labor and fuel.

Send for Circular and Price List of Cleaner and Hoes.

22 &amp; 24 POWER BLOCK, CLEVELAND, O.



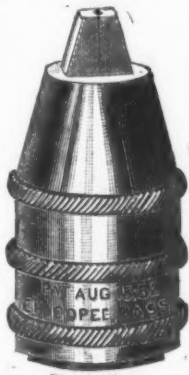




## The Chicopee Automatic Drill, FOR METAL AND WOOD.



These cuts represent the new patented device for drilling in metal or wood, which is pronounced by all mechanics and machinists the most perfect mechanical tool for that purpose ever invented. The spindle is steel, with right and left handed grooves. The slide has right and left handed nuts to match the same, one operating on the forward and the other on the backward stroke, so that moving the slide gives to the Drill a continued motion in one direction only.



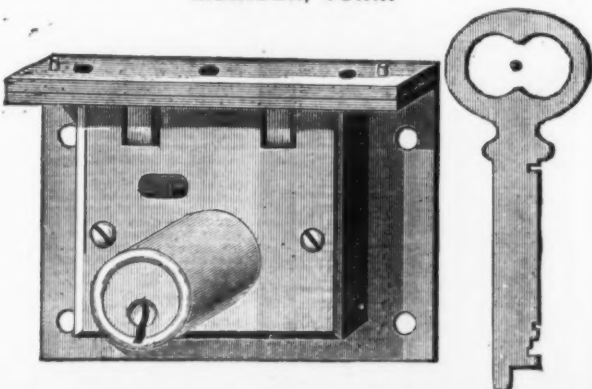
The chuck connected with this Drill is made entirely of steel, with hardened steel jaws, and is held on the spindle by friction, and can be easily removed to use on lathes or other tools. It is accurately made to hold "Morse Twist Drills" to 3-16 inch, and is pronounced the best SMALL CHUCK ever offered in the market.

The end of drill-handle is made hollow, for the safe keeping of the drills.

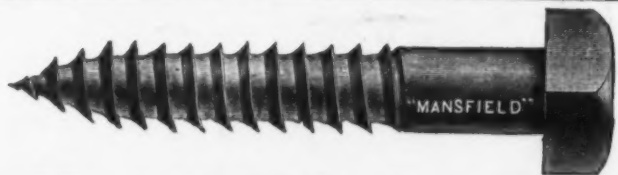
**POPE & STEVENS,**  
AGENTS,

114 Chambers Street, - - NEW YORK.

**THE CHARLES PARKER CO.,**  
MERIDEN, CONN.



MANUFACTURERS OF CABINET LOCKS.



**The Mansfield Bolt & Nut Co.**

MANSFIELD, OHIO,

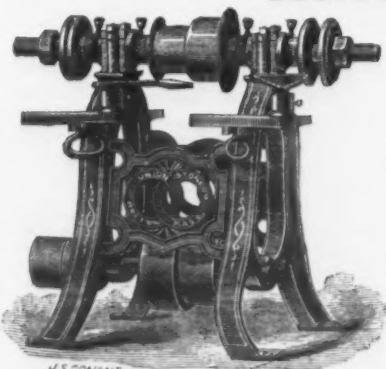
MANUFACTURERS OF

**GIMLET-POINTED COACH SCREWS**

AND

**TURNED HEAD FULL SQUARE  
CARRIAGE BOLTS.**

**UNION STONE COMPANY,**  
BOSTON, MASS.



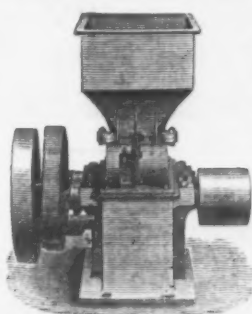
Patentees and  Manufacturers

**UNION EMERY WHEEL.**

Emery, Emery Wheel Machinery and Tools  
A SPECIALTY.

Automatic Knife Grinding Machines,  
WOOD POLISHING WHEELS,  
Emery Quartz, Cloth, Corundum,  
Grinders' and Polishers' Supplies.

Catalogue on Application.



NEWELL'S

**UNIVERSAL MILL.**

Pulverizes everything—hard, soft, sticky, and gummy. Grain, Drugs, Chemicals, Clay, Guano, Cotton Seed, Bark, &c., &c. A wonderful machine for grinding Corn, Oats, Feed, &c. Also Steam Engines, Boilers, &c., at lowest rates. Send for circular.

34 CORTLANDT STREET,  
NEW YORK.

**RIVETS, BOILER, TANK AND BRIDGE.**  
STANDARD RIVET CO., Cleveland, Ohio.

'THERE IS NO USE DENYING IT, THE

# LUSTRO

## POLISHES ARE THE STANDARD OF THE WORLD.

**LUSTRO METAL POLISH**

HAS BEEN THOROUGHLY TESTED AND UNIVERSALLY APPROVED as a means of quickly and without labor restoring and preserving unsullied the brightness of Silverware, Jewelry, Nickel Stove Plates, Plated Ware, Show Cases, &c.

**LUSTRO STOVE POLISH,**

IS COMPOSED OF THE VERY BEST MATERIALS; will black more stoves in a given length of time than any other polish now on the market. It produces a dark, brilliant polish, is free from dust, and gives satisfaction every time. After a trial you will buy no other.

**LUSTRO METAL POLISH** put up in 4 oz. Bottles, 1 Doz. in Case.

**LUSTRO STOVE POLISH** packed in Patent Cans, and Attractively Labeled.—1 and 5 lb. cans for Stove Dealers and Manufacturers; 3 oz. Tins in 1/4 gro. Box for Household use.

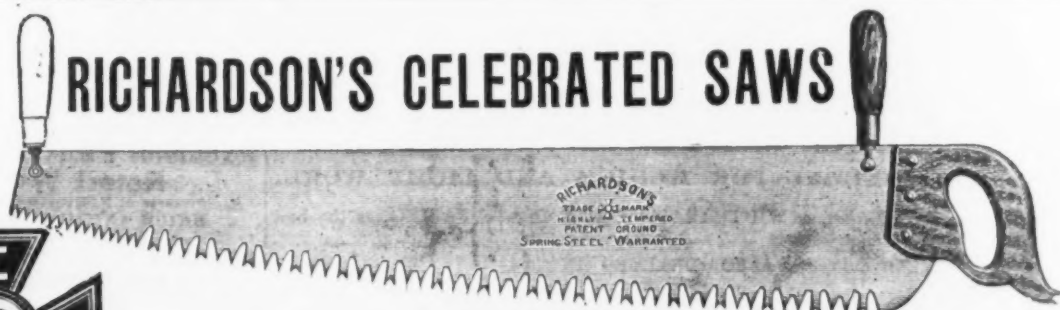
A TRIAL ORDER SOLICITED.

BEWARE OF IMITATIONS.

## THE LUSTRO COMPANY,

Sole Proprietors of the "Lustro Polishes," 171 Duane St., N. Y.

## RICHARDSON'S CELEBRATED SAWS



Richardson's Trade Mark. A Maltese Cross With the Letters B E S T. Emblematical of the Standing of the Saws in the Trade.

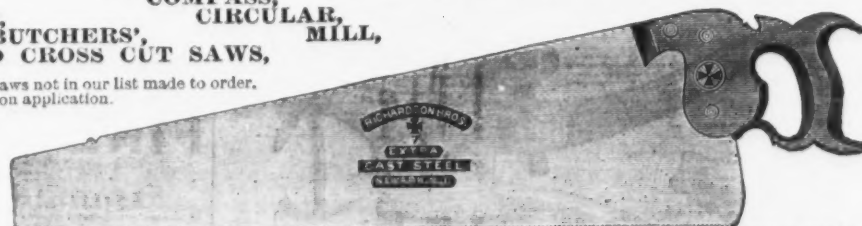
**RICHARDSON'S SAWS**

Have Justly Obtained an Enviably Reputation.

WE MAKE A FULL LINE OF

HAND, PANEL, BACK, COMPASS, CIRCULAR, MILL,  
RIP, BUTCHERS', AND CROSS CUT SAWS,

Special Saws or any Saws not in our list made to order. Illustrated catalogue on application.



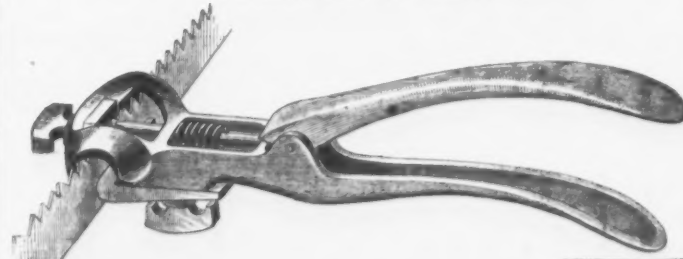
RICHARDSON'S HAND SAWS ARE UNEQUALED FOR TEMPER AND WORKMANSHIP; TAPER GROUND, THIN AT BACK, PERFECTLY TRUE



RICHARDSON'S PATENT TEMPERED AND PATENT GROUND SAWS.  
**RICHARDSON SAW WORKS,** 15 to 27 River St., Newark, N. J., U. S. A.

**MORRILL'S PERFECT SAW SETS AND BENCH STOP.**

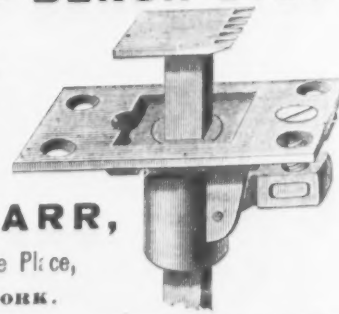
FOR SETTING EVERY VARIETY OF SAWS.



For price lists  
and discounts  
Address

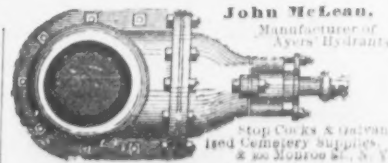
**ASA FARR,**

64 College Place,  
NEW YORK.



**HINGES.** JAMES MANN & SONS,  
75 MAIN STREET,  
BUFFALO, N. Y.

Manufacturers of 2, 4, 6, 8, and 10 in. Heavy Strap Hinges. Our facilities enable us to quote lower prices than any other manufacturer. Will sell Half Bazel Lots, Assorted. Also manufacturers of MANN'S PATENT CONNECTING LINK, for Chains. Considered the best in the market for Lumbermen and all that use chains.



John McLean,  
Manufacturer of  
Hydraulic





Issues Policies of Insurance after a careful inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

**Boilers, Buildings and Machinery,**

ARISING FROM

**STEAM BOILER EXPLOSIONS.**

The Business of the Company includes all kinds of Steam Boilers.

Full information concerning the plan of the Company's operations can be obtained at the

**COMPANY'S OFFICE, HARTFORD, CONN.,**  
or at any agency.

**J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. Pierce, Sec.**

**Board of Directors.**

J. M. ALLEN, President, Hartford and New York.  
LEONARD J. HENDRICK, President, Hartford and New York.  
FRANK V. CHENEY, of Cheney Bros. Silk Mfrs., Hartford and New York.  
CHARLES M. BEACH, of Beach & Company, Hartford and New York.  
DANIEL PHILLIPS, of Adams' Express Company, Hartford and New York.  
GEO. M. BARTHOLOMEW, President Holyoke Water Power Company, Hartford and New York.  
RICHARD W. H. JARVIS, President Colt's Pat. Fire Arms Manufacturing Co., Hartford and New York.  
THOMAS O. ENDERS, of the Aetna Life Insurance Co., Hartford and New York.  
LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co., Hartford and New York.  
GEN. WM. B. FRANKLIN, Vice-President Colt's Pat. Fire Arms Mfg. Co., Hartford and New York.  
GEO. CROMPTON, Crompton Loom Works, Worcester, Mass., Hartford and New York.  
HON. THOMAS TALBOT, Ex-Governor of Massachusetts, Lowell, Hartford and New York.  
NEWTON CASE, of the Case, Lockwood & Brainard Co., Hartford and New York.  
WM. & SLATER, Cotton Manufacturers, Providence, Hartford and New York.  
NELSON HOLLISTER, of the State Bank, Hartford, Hartford and New York.  
CHAS. T. PARRY, of Baldwin Locomotive Works, Philadelphia, Hartford and New York.  
HON. HENRY C. ROBINSON, Attorney at Law, Hartford and New York.

**AMERICAN FACING CO.**

AND

**WHITEHEAD BROTHERS'**

**FOUNDRY FACINGS**

And Supplies of all Kinds.

BITUMINOUS OR SEA COAL, LEHIGH, CHARCOAL, SOAPSTONE, INDIA  
SILVER AND GERMAN LEADS, &c.

**XX MINERAL FOR HEAVY WORK.**

**X MINERAL FOR MEDIUM AND LIGHT WORK.**

Our fine Facing known, as WHITEHEAD'S STOVE PLATE FACING, is the best  
in use. Send us a sample order.

ALSO DEALERS IN

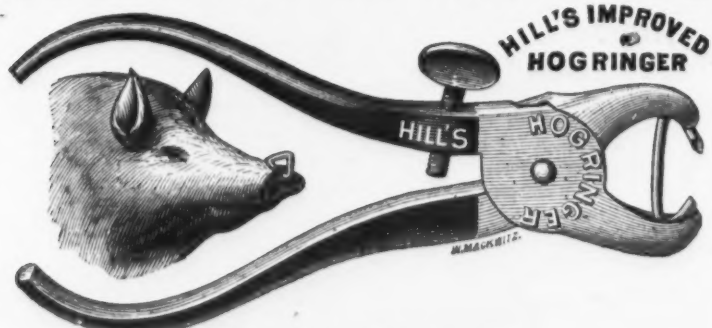
**MOLDING SAND,**  
Fire Sand, Fire Clay and Kaolin.

We give special attention to the selection of Albany and Crescent Sands for Stove  
Plate and Ornamental Iron and Brass Castings.

**WM. WHITEHEAD, Treas.,**

515 and 517 West 15th St., New York City.

**HILL'S IMPROVED HOG RINGER.**



CLOSES ALL THREE SIZES OF THE

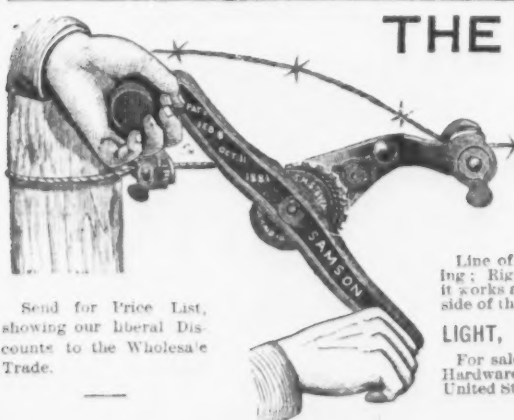
**HILL TRIANGULAR PIG, SHOAT AND HOG RINGS.**

**H. W. HILL & CO.,**

SOLE MANUFACTURERS

H. W. HILL,  
C. P. ROUSUM,

DECATUR, ILL.



**THE SAMSON**

is the Best, the Simplest  
and most Portable

**WIRE**

**STRETCHER**

in the Market.

Line of Draft direct: always Self-Adjust-  
ing: Rigid Double Handle: Double Pawl:  
it works at either end of the fence, at either  
side of the post and either side up.

**LIGHT, PORTABLE, SIMPLE, SURE.**

For sale by all leading wholesale Jobbing  
Hardware Houses and Barb Wire men in the  
United States.

MANUFACTURED ONLY BY

**SAMSON NOVELTY WORKS, Nos. 14 & 16 Main St., De Kalb, Ills.,**

AND IN CANADA BY

**BULLOCK HARDWARE CO., Ottawa, Ontario.**

**B. KREISCHER & SONS,**  
**FIRE BRICK.**

BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River,  
NEW YORK.

**NEWTON & CO.,**  
ALBANY, N. Y.,  
MANUFACTURERS OF BEST QUALITY

**FIRE BRICK**  
AND  
**STOVE LININGS.**

English, Scotch and Welsh

**FIRE BRICKS,**  
Dinas and Silica Bricks  
for Glass and Steel Works.

**S. A. RIMINGTON,**  
40 and 42 Broadway, New York.  
Yard foot of 4th St., Hoboken, N. J.

**M. D. VALENTINE & BRO.,**

Manufacturers of

**FIRE BRICK**  
And Furnace Blocks,  
DRAIN PIPE AND LAND TILE,  
Woodbridge, - - N. J.

**BORGNER & O'BRIEN,**

Manufacturers

**FIRE BRICK**

AND

Edge Pressed Furnace Blocks,  
CLAY RETORTS, TILES, &c.,  
Twenty-third Street,  
above Race, PHILADELPHIA.  
Twenty years' practical Experience.

**WATSON FIRE BRICK CO.,**

ESTABLISHED 1845.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey  
Manufacturers of

**FIRE BRICK,**  
FOR ROLLING MILLS, BLAST FURNACES, FOUN-  
DRY GAS WORKS, LIME KILNS, TANNERIES,  
BOILER AND GRATE SETTING, GLASS WORKS, &c.  
Fire Clays, Fire Sand, and Kaolin for Sale.

**HENRY MAURER,**  
Proprietor of the  
**Excelsior Fire Brick & Clay**  
**Retort Works,**

Manufacturer of FIRE BRICK, HOLLOW  
BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY  
Office & Depot 418 to 422 East 23d St., N. Y.

**TROY FIRE BRICK WORKS,**

Troy, N. Y.,

**JAMES OSTRANDER & SON,**

Established 1848. Manufacturers of

**FIRE BRICK,**

Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and  
Dealers in Woodbridge Fire Clay and Sand, and Staton  
Island Kaolin.

Established 1864.

**GARDNER BROTHERS,**

Manufacturers of

**STANDARD SAVAGE FIRE BRICK,**  
TILE & FURNACE BLOCKS,  
OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and  
Miners and Shippers of Fire Clay.  
OFFICE: 116 Smithfield St., Pittsburgh, Pa.  
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

**HALL & SONS,**

**FIRE BRICK,**

Buffalo, N. Y.

**UNION MINING COMPANY.**

**Mount Savage Fire Brick.**

**EDWARD J. ETTING Agent,**

222 South Third St., Philadelphia, Pa.

**MILLER'S BRICK PRESSES**

Established 1844.

**FIRE AND RED BRICK.**

And Brickmakers' Tools in General.

**SAML. P. MILLER & SON,**

309 South 5th St., Philadelphia.

**A. HALL TERRA COTTA CO.,**

Manufacturers of

**FIRE BRICK, FURNACE BLOCKS, &c.**

ARCHITECTURAL TERRA COTTA.

Moulded, Buff, and Colored Building Brick.

Perth Amboy, N. J.

**CHAS. D. COLSON,**

DINAS, SCOTCH, SAVAGE, JERSEY, and other

**FIRE BRICKS.**

The Largest and Best Assorted Stock of Tiles  
and Bricks, Fire Clay, Foundry Supplies, &c., in  
the United States.

**CHICAGO ILL.**

**CARL KUSEL,**

In Hamburg, Germany,

**BUYS MALLEABLE IRON, GAS**

**FITTINGS.**

LOWEST QUOTATIONS ARE DESIRABLE.

**WESTPHAL'S PAT. INDEPENDENT REVOLVING SHELVES**

—AND—

**SELF-LOCKING SCREW CASE.**

Made from the Best Gray,  
Malleable and Sheet Iron.

This is not a Drawer Case. This Structure has been  
purposely invented on account of trouble caused by  
a Drawer.

The Standard of This Case is a Hollow Cone,  
Firm as a Rock, on Which all  
Shelves Revolve.

All Shelves can be taken off and replaced in a few  
minutes.

The ornamental front frames of each Circle, well  
protected, contain a piece of glass, whereby the dealer  
can see through all Compartments in a minute,  
and if any number is out, can fill, or if not in stock,  
can order, which in a Drawer Case makes a great  
deal of trouble. The front frames can be taken out  
and replaced by anyone in no time, thus making it  
the most perfect structure ever placed upon the  
market. With beauty and strength combined, it  
surpasses even perfection in the highest state.

YOU HAVE NO DRAWERS TO TAKE OUT OR PUT BACK.  
No mixing of Screws by Customers helping them  
selves, as is the case with Drawers taken from the  
Shelves; or still worse, when standing on the  
counter. No losing of Customers while looking  
through Drawers of mixed screws.

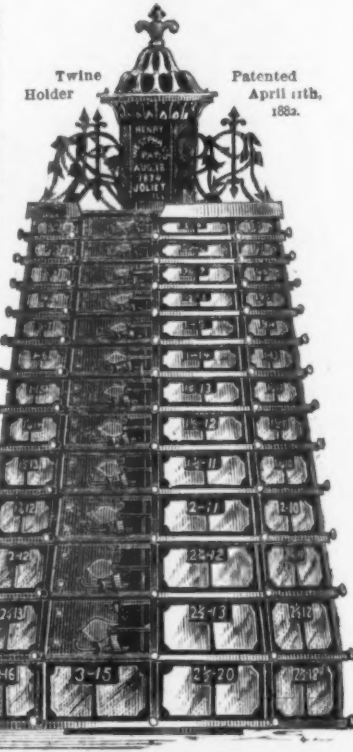
IS OUR CASE ONLY ONE COMPARTMENT IS OPEN AT THE  
TIME AND THE BALANCE ALL CLOSED. No one can get  
into the Case except the men behind the counter.  
Any number can be found in a moment, by simply  
turning to the right, numbers INCREASE, by turning  
to the left, DECREASE. All numbers are cast on the  
frames and gold-bronzed. WE GUARANTEE OUR CASE  
FOR 5 YEARS, AND IF NOT FOUND SUPERIOR TO ANY CASE  
NOW OFFERED TO THE TRADE, AFTER TRIAL, CAN BE RE-  
TURNED AT OUR EXPENSE, AND WILL REFUND THE  
MONEY.

**HENRY WESTPHAL,**

MANUFACTURER,

86 Market St., CHICAGO, ILL.

WE ALSO MANUFACTURE  
BOLT AND SHOT CASES.



**American Bolt and Screw Case Co.**

Successors to W. R. Baker & Co., DAYTON, OHIO.

MANUFACTURERS OF  
REVOLVING BOLT AND SCREW CASES.



We would respectfully call your attention to  
our Bolt and Screw Cases, which we have been  
introducing into the market for the past year,  
and our sales have shown that we have met the  
highest expectations that we have lately very  
materially increased our facilities for manu-  
facturing the same, in which connection we have  
added several improvements, which make them  
now as perfect and complete, as well as orna-  
mental, as could be desired. We are now using  
iron standards, screwed firmly into an iron hub  
in the bottom, which makes them perfectly true  
and solid. The tops and bottoms are double,  
with the grain of the wood crossed, glued and  
screwed together and braced with iron rods,  
which bind the whole firmly together, thus mak-  
ing strong enough to bear three times the weight  
that can be put into them, and by which means  
they revolve perfectly true and easy. Both Bolt  
and Screw Cases are made of the best seasoned  
Tennessee pine, finished in imitation of black  
walnut. The fronts of doors are of best Norway  
pine, with the lines which they contain nicely  
printed on, making it at once a most desirable  
and beautiful appendage to hardware stores.  
We have endorsements from the American Screw  
Co., and innumerable testimonials from the large-  
est jobbing hardware houses in the country, as  
the most practicable, durable and ornamental  
cases in the market, and no hardware or iron  
store is complete without one, as they prevent  
mixing of screws and bolts, thus enabling them  
to keep their stock in good shape, thereby mak-  
ing it a pleasure to handle them instead of a  
task. The saving of space, as well as the con-  
venience of handling, is a desideratum not to be  
bought for the cost of a case. The drawers are  
provided with stops to prevent their removal,  
and will hold a package of bolts or screws.

**PRINCIPAL AGENTS.**

Markley, Alling & Co., Chicago, Ill.  
Ducharme, Fletcher & Co., Detroit, Mich.  
Hibbard, Spencer, Bartlett & Co., Chi-  
cago, Ill.; Burger & Baumgard, New  
York City; Lloyd, Supplies & Walton,  
Philadelphia, Pa.; Sam'l G. B. Cook &  
Co., Baltimore, Md.; Bindley Hardware  
Co., Pittsburg, Pa.; A. F. Shapleigh &  
Canwell Hardware Co., St. Louis, Mo.;  
T. W. Eaton, Cedar Rapids, Iowa; Far-  
well, Osgood & Jackson, St. Paul, Minn.;  
Howell, Gano & Co., Cincinnati, Ohio;  
Hall & Villa Hardware Co., Kansas City,  
Mo.; Pratt & Co., Buffalo, N. Y.; Seeber-  
ger, Brenkey & Co., Chicago, Ill.; H. O.  
Ferguson, Minneapolis, Minn.;  
Ware Co., St. Joseph, Mo.; Pratt & Co., Elmira, N. Y.; A. Baldwin & Co., New Orleans, La.; G. M. Way, Har-  
ford, Conn.; J. S. Brown, Galveston, Tex.; Gordon Hardware Co., San Francisco, Cal.; Western Hardware  
Co., Atchison, Kan.; J. W. Warren & Co., Troy, N. Y.

Send for Illustrated Price List.



**BLAIR'S HOG & PIG RINGER,**

Will Close Most all Kinds Rings, Large and Small.

**SOLD BY JOBBERS. Order Early.**

**E. BLAIR, Bucyrus, Ohio.**

THOMPSON McCOSH, President.

JOHN A. McCOSH, Sec. and Treas.



Chicago, Nos. 16 and 18 West Lake Street.

**WOODLAND FIRE BRICK CO., LIMITED,**

Woodland, Clearfield Co., Pa.,

MANUFACTURERS OF

"WOODLAND" BRAND FOR STEEL FURNACES OF ALL KINDS, BLAST FURNACES AND  
MALLEABLE IRON WORKS.

"BRADFORD" Brand for Rolling Mills, Glass Houses, &c.

"W. F. B." Brand for Hot Blast Stoves, Stacks, Cupolas, and all work requiring a cheap  
grade of brick. Also, Fine Ground Clay to lay brick.

Western Office, 26 Sixth Street, Pittsburgh, Pa.



# The Iron Age Directory and Index to Advertisements.

## Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

### Alphabetical Index.

## Drilling Machines.

Box, Alfred & Co., 312 Green St., Philadelphia, Pa. 45

Clark, S. & Co., Springfield, Ohio. 46

Miller, F. & Co., Chambers, N. Y. 47

Perkins, J. & Co., Chambers, N. Y. 48

Pope & Stevens, 114 Chambers, New York. 49

Sellers, Wm. & Co., Phila., and 70 Liberty St., N. Y. 45

Thorne, De Haven & Co., Philadelphia. 46

Wiley & Russell Mfg. Co., Greenfield, Mass. 46

## Drop Forgings.

Brooks, R. H. & Co., Westville, Ct. 41

Crane Bros. Mfg. Co., Chicago, Ill. 42

## Drop Hammers.

Williams, White & Co., Moline, Ill. 43

## Keave Cutters.

Eckel & Co., Richmond, Ind. 44

## Makers of.

Doehner, M. & Co., Chambers, N. Y. 37

Clem & Morse, Philadelphia, Pa. 45

Stokes & Parrish, Philadelphia. 44

## Emery and Emery Wheels.

Union Stone Co., Boston, Mass. 40

## Emery Wheel Turning Tools.

Torrey, R. & Co., Worcester, Mass. 41

## Engines and Saw Mills.

Farquhar, A. B., York, Pa. 47

## Engines, etc.

Schleicher, Schumm & Co., Philadelphia. 45

## Engines Locomotive.

Baldwin Locomotive Works, Philadelphia, Pa. 46

## Engines, Steam, Makers of.

Cox & Sons, Philadelphia, Pa. 48

Dunbar, R. & Son, Buffalo, N. Y. 49

La France Fire Engine Co., Elmira, N. Y. 45

Rumsey, L. Mfg. Co., St. Louis, Mo. 46

Smith, H. & Co., Philadelphia, Pa. 47

The Norwalk Iron Works Co., Norwalk, Conn. 44

The Fawcett & Jones Co., Wilmington, Del. 45

Wetherill, H. & Co., Chester, Pa. 46

## Engravers, Wood.

Crosscup & West, Philadelphia, Pa. 41

Stillman & Co., Cincinnati, Ohio. 42

## Exhausters.

Buffalo Forge Co., Buffalo, N. Y. 43

## Foundries.

Emrick, J. A. & Co., Philadelphia, Pa. 45

Faxon, J. & Co., 41 Beech, Phila. 46

## Foundries, Makers of.

McNab & Hartin Mfg. Co., 30 Gold, N. Y. 43

North Brothers, Philadelphia, Pa. 44

Patience, J. & Co., Chambers, N. Y. 45

Enterprise Mfg. Co. of Pa., Phila. and N. Y. 46

Carr & Hobson, 47 Cliff, New York 47

## Fences, Wrought Iron.

Wm. E. T. and Iron Works, Detroit, Mich. 43

## Fencing, etc.

Cleveland Wrought Iron Fence Wks., Cleveland, O. 47

## Files, Makers of.

Field, Alfred & Co., 91 Chambers, N. Y. 45

Carr, J. & Co., 30 Gold, N. Y. 46

Montgomery, J. & Co., 110 Union St., N. Y. 47

## Files, Manufacturers of.

Auburn File Works, Chambers, N. Y. 48

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

## Horse Nails.

Brooks, R. H. & Co., Westville, Ct. 41

Crane Bros. Mfg. Co., Chicago, Ill. 42

Miller, F. & Co., Chambers, N. Y. 47

Perkins, J. & Co., Chambers, N. Y. 48

Pope & Stevens, 114 Chambers, New York. 49

Sellers, Wm. & Co., Phila., and 70 Liberty St., N. Y. 45

Thorne, De Haven & Co., Philadelphia. 46

Wiley & Russell Mfg. Co., Greenfield, Mass. 46

## Drop Forgings.

Brooks, R. H. & Co., Westville, Ct. 41

Crane Bros. Mfg. Co., Chicago, Ill. 42

## Drop Hammers.

Williams, White & Co., Moline, Ill. 43

## Keave Cutters.

Eckel & Co., Richmond, Ind. 44

## Makers of.

Doehner, M. & Co., Chambers, N. Y. 37

Clem & Morse, Philadelphia, Pa. 45

Stokes & Parrish, Philadelphia. 44

## Emery and Emery Wheels.

Union Stone Co., Boston, Mass. 40

## Emery Wheel Turning Tools.

Torrey, R. & Co., Worcester, Mass. 41

## Engines and Saw Mills.

Farquhar, A. B., York, Pa. 47

## Engines, etc.

Schleicher, Schumm & Co., Philadelphia. 45

## Engines Locomotive.

Baldwin Locomotive Works, Philadelphia, Pa. 46

## Engines, Steam, Makers of.

Cox & Sons, Philadelphia, Pa. 48

Dunbar, R. & Son, Buffalo, N. Y. 49

La France Fire Engine Co., Elmira, N. Y. 45

Rumsey, L. Mfg. Co., St. Louis, Mo. 46

Smith, H. & Co., Philadelphia, Pa. 47

The Norwalk Iron Works Co., Norwalk, Conn. 44

The Fawcett & Jones Co., Wilmington, Del. 45

Wetherill, H. & Co., Chester, Pa. 46

## Engravers, Wood.

Crosscup & West, Philadelphia, Pa. 41

Stillman & Co., Cincinnati, Ohio. 42

## Exhausters.

Buffalo Forge Co., Buffalo, N. Y. 43

## Foundries.

Emrick, J. A. & Co., Philadelphia, Pa. 45

Faxon, J. & Co., 41 Beech, Phila. 46

## Foundries, Makers of.

McNab & Hartin Mfg. Co., 30 Gold, N. Y. 43

North Brothers, Philadelphia, Pa. 44

Patience, J. & Co., Chambers, N. Y. 45

Enterprise Mfg. Co. of Pa., Phila. and N. Y. 46

Carr & Hobson, 47 Cliff, New York 47

## Fences, Wrought Iron.

Wm. E. T. and Iron Works, Detroit, Mich. 43

## Fencing, etc.

Cleveland Wrought Iron Fence Wks., Cleveland, O. 47

## Files, Makers of.

Field, Alfred & Co., 91 Chambers, N. Y. 45

Carr, J. & Co., 30 Gold, N. Y. 46

Montgomery, J. & Co., 110 Union St., N. Y. 47

## Files, Manufacturers of.

Auburn File Works, Chambers, N. Y. 48

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co., 11 and 13 Richmond, Phila. 49

Boyd, H. & Co.,



# KEITH, BENHAM & DEZENDORF,



SUCCESSORS TO  
**BRINTNALL, LAMB & CO.,**

WHOLESALE

**HARDWARE,**  
Cutlery, Tin Plate,  
**NAILS,**  
BARB FENCE WIRE, &c.

SPECIAL ATTENTION TO

MANUFACTURERS' ORDERS FOR

Spring, Bailing & Mattress Wire

ALL ORDERS

PROMPTLY AND CAREFULLY EXECUTED.

96, 98, 100, 102 & 104 Wabash Ave.,

CORNER OF WASHINGTON STREET,

**CHICAGO.**



**THE GIANT PAD LOCK.**  
Manufactured by  
**THE SMITH & EGGE MFG. CO.**  
(Centennial Award.)

"Superior in Every Respect."  
This is one of the best selling Locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted.

Orders solicited. Address as above.  
Lock Box 1705, Bridgeport, Conn.

AGENTS:  
FLAGLER FORSYTH & BRADLEY 298 Broadway, N. Y.

**IMPROVED  
CORNELL CORN SHELDER  
FOR 1882.**



Will shell more corn with less labor than any other machine in market. The only sheller made that uses spiral springs for the pressure bar. Every machine warranted to do as good work as any sheller made. For ask to see the Cornell Sheller, try it and you will buy no other. Address,  
**TREMAN, WATERMAN & CO.,**  
ITHACA, N. Y.

## STANDARD VARNISH WORKS. D. ROSENBERG & SONS,

734 736, 738, 740 E. 14th St., NEW YORK.

243 Wabash Avenue, CHICAGO, ILL.

MANUFACTURERS OF JAPANS AND COPAL VARNISHES OF ALL DESCRIPTIONS.

## Baking Japans and Bronzing Varnishes SPECIALTIES.

Our Baking Japans and Bronzing Varnishes are being used by the throughout this country and abroad, and we beg to refer to the following leading consumers of these articles parties as to their superior qualities:

Singer Mfg. Co., Elizabethport, N. J., and Glasgow, Scotland.  
Wheeler & Wilson Mfg. Co., Bridgeport, Ct.  
American Sewing Machine Co., Philadelphia, Pa.  
St. John Sewing Machine Co., Springfield, Ohio.  
Medina Mfg. Co., Medina, N. Y.  
New Home Sewing Machine Co., Orange, Mass.  
Florence Sewing Machine Co., Florence, Mass.  
Sargent & Co., New Haven, Ct.  
P. & F. Corbin, New Britain, Ct.  
Stanley Works, New Britain, Ct.

Landers, Fray & Clark, New Britain, Ct.  
Eaton, Cole & Burnham Co., Bridgeport, Ct.  
Norwalk Lock Co., Norwalk, Ct.  
Bradley & Hubbard Mfg. Co., Meriden, Ct.  
Charles Parker Co., Meriden, Ct.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Trenton Lock and Hardware Co., Trenton, N. J.  
Peck, Stow & Wilcox Co., Southington, Ct., and Cleveland, Ohio.  
Shurmer & Massey Mfg. Co., Cleveland, Ohio.

Elbell, Gilliam & Co., Canton, Ohio.  
Livingston & Co., Pittsburgh, Pa.  
James Smart Mfg. Co., Brockville, Canada.  
Burrows, Stewart & Milne, Hamilton, Canada.  
R. M. Wanzer & Co., Hamilton, Can.  
Buffalo Hardware Co., Buffalo, N. Y.  
Sidney Shepard & Co., Buffalo, N. Y.  
Enterprise Mfg. Co., Philadelphia, Pa.  
E. & T. Fairbanks & Co., St. Johnsbury, Vt.  
Buffalo Scale Co., Buffalo, N. Y.  
Jos. Barnhurst, Philadelphia, Pa.  
Van Wagoner & Williams, New York, and many others.

## SANFORD'S PATENT OX SHOE

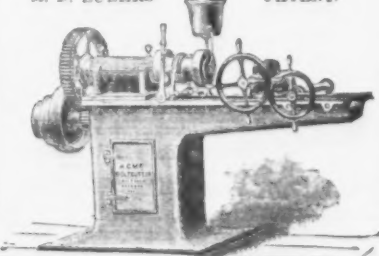


The only shoe that will not lame an ox, which he can stand up square upon, and will prevent slipping. Send for circulars. Liberal discount to dealers. Manufactured by

**SHADBOLT, BOYD & CO., Milwaukee, Wis.**

## "ACME" BOLT CUTTERS WITH CAP DIES.

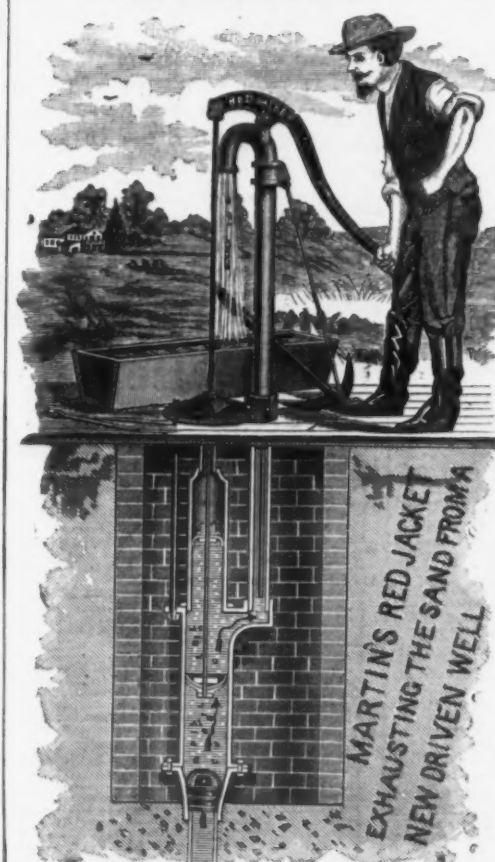
M. D. LUEHR'S PATENT.



Double Automatic Bolt Cutters, Single Bolt Cutters, 1/4 in. to 1 in. Rapid Bolt Cutters, Nut Tappers, 1/4 in. to 1 in. Rapid Nut Tappers, 1/4 in. to 1 in. Spindles, Bolt Presses, four different styles. Bolt Pointers, Nut Presses, &c.

**NOVELTY IRON WORKS  
CLEVELAND, OHIO.**

## CINCINNATI PUMP CO.



These cuts represent the renowned

**RED JACKET**  
ADJUSTABLE  
DOUBLE-ACTING  
Lift and Force  
PUMPS,

For General Purposes.

Highest Prizes awarded where ever exhibited. Thousands now in use throughout the States, giving perfect satisfaction. Fitted for hand and power. Also the

Lafferty Patent

Screw Cylinder, Porcelain Lined,  
**WOOD PUMP.**

Agents wanted everywhere. For particulars address

CINCINNATI PUMP CO., Cincinnati, Ohio, U. S. A.

**CHICAGO FORGING CO.,**  
No. 14 Metropolitan Block,  
CHICAGO, ILL.

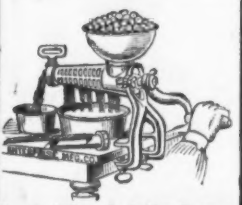
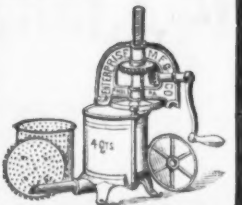
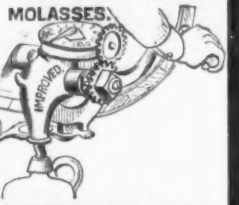
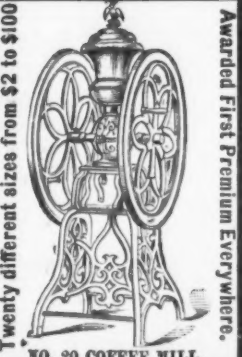

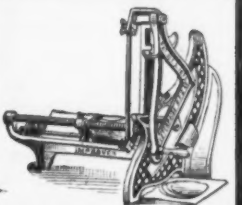
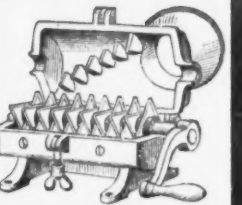

**DROP FORGINGS**  
IRON AND STEEL  
OF EVERY DESCRIPTION

For Fire Arms, Saw and Wind Mills, Engine, Tool and Machine parts of all kinds. Railroad and Marine Work. Agricultural Implements and Machinery, Carriage and Wagon Irons, Electrical and other Apparatus.

Orders for Forgings in Iron or Steel required to be duplicated in large numbers, or which may be too small, intricate or expensive to be made by hand on the anvil, are especially solicited. Estimates furnished upon receipt of sample or patterns of forgings required.

ANSON STAGER, President.  
W. H. SWIFT, Vice-President.  
E. L. BROWN, Treas. & Gen. Mgr.  
F. J. CUSHING, Secretary.



 Fruit, Wine & Jelly Press.	 SAUSAGE STUFFER.	 MOLASSES Self-Measuring Faucet.
 Twenty different sizes from \$2 to \$100. No. 20 COFFEE MILL.	<b>ENTERPRISE MANUFACTURING CO. OF PA.,</b> THIRD & DAUPHIN STS, PHILADELPHIA, PA.	
	 Tincture Presses, Self-Weighing Cheese Knife, Cork Presses. <b>THE BEST ARE THE CHEAPEST.</b> MRS. POTTS' Cold Handle Double Pointed Sad Irons. SOLD BY HARDWARE DEALERS. SEND FOR ILLUSTRATED CATALOGUE, FREE.	
 Smoked Beef Shaver.	 SAUSAGE CUTTER.	 Bung Hole Borer. Tobacco & Root Cutter.

**THE STANLEY WORKS,**  
MANUFACTURERS OF  
**Wrought Iron Butts, Hinges**  
AND  
**DOOR BOLTS,**  
Plain, Japanned, Bronzed and Plated.  
**FACTORIES:** New Britain, Connecticut. **WAREHOUSE:** 79 Chambers St., New York.


**REED & CO., Higganum, Conn.**  
Sole Manufacturers of the Star Tool Co.'s  
**TRY SQUARES, RULES, BEVELS, &c.**  
AND HARDWARE SPECIALTIES.  
Having bought all the machinery of the Star Tool Co., we are now prepared to supply the trade with a complete line of these goods. We use none but the best material, and all goods purchased of us are fully warranted. A complete list, with prices, sent on application.  
Sole Agents, C. E. JENNINGS & CO., 96 Chambers St., N. Y.

**Bemis & Call Hardware & Tool Co.**  
  
**PATENT COMBINATION WRENCH.**  
These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench thus making a combination which has no equal.  
For Circulars and Price List, address  
**BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.**

**BEAN'S PATENT**  
**TUBULAR FRAME GARDEN & RAILROAD BARROWS.**  
  
With patent steel and iron wheels. Handles and wheels shipped in bundles. Woodwork in crates at lowest rates of freight. The Barrows are easy to set up, and are the lightest, strongest and best Barrows in the World.  
For circulars and price lists, Address  
**THE TRICYCLE MFG CO.,**  
Springfield, O., U. S. A.

**Henderson's Patent Refractory Compounds.**  
**THE SILICA BRICK OR COMPOUND.**  
This compound is adapted to all uses to which silica and fire-clay brick are used. Its advantages are: Production below cost of common red brick for labor and materials; neither expands nor contracts from molding to highest temperature. Infusibility at any temperatures used in the arts. Self-baking or burning in the use. Can be made in any locality where sand is obtainable. No outlay of capital for apparatus. Made by unskilled labor at place where used. May be used in bulk by ramming behind a core, or molded into brick. Repairs are made by patching the fire-worn surface with the same compound. Is adapted for molding steel castings.  
**THE LIME OR MAGNESIAN LIME COMPOUND.**  
This possesses all of the above advantages, with the addition of being better adapted for silver and lead smelting furnaces, iron and steel converting furnaces, and other uses where greater wear or chemical charges are produced by use of silica, and of being made in localities where sand is not obtainable, and of being below cost of red brick for labor and material.  
For particulars as to manufacture and licenses, apply to  
**JAMES HENDERSON, Agent, Bellefonte, Centre Co., Penn.**

**The "Eureka" Pipe Cutter**

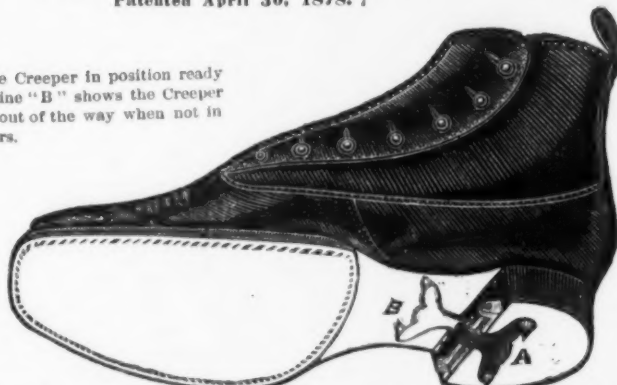


**THE BODY**—is fitted with an adjustable Cast-Steel Jaw at the point where it comes in contact with the Pipe, which Jaw can be renewed at any time by simply removing one screw. By this system the wearing away of the Jaw (which in other cutters is the first part to give out) is effectually prevented, and this tool can be kept in first-class order at all times.  
**THE WHEEL BLOCK**—This is also of Steel, neatly fitted to its socket and cannot be dropped out. It is much more durable than the cast-iron blocks and is hardened at the point where the rod comes in contact with it.  
**THE HANDLE**—of this Cutter is put on to stay, and cannot be removed by the roughest usage, as it is an iron handle, cast fast to the Rod, operating the block.  
—MANUFACTURED BY—  
**Pancoast and Maule** { 243 & 245  
SOUTH THIRD STREET  
PHILADA.

**IMPROVED "CLIMAX" REVERSIBLE ICE CREEPER.**  
Patented April 30, 1878.

"A" represents the Creeper in position ready for use. The dotted line "B" shows the Creeper thrown back entirely out of the way when not in use, or walking indoors.

We offer to the Trade this season this favorite Creeper greatly improved.



**CHILDS, GROFF & CO., Mfrs., Cleveland, Ohio.**

ALSO FOR SALE BY  
BIDDLE HARDWARE CO., Philadelphia. PECK & SNYDER, New York. J. P. PHINNEY & CO., Boston.  
E. T. BARNUM, Detroit. EDWIN HUNT'S SONS, Chicago. SIMMONS HARDWARE CO., St. Louis.

**RIPLEY MANUFACTURING CO.,**  
Unionville, Conn., U. S. A.

  
**BEST PORCELAIN-LINED LEMON SQUEEZERS**  
"COMMON SENSE" MOUSE TRAPS, MALLETS, BOOT JACKS,  
ROSEWOOD FAUCETS, &c. Fine Wood Turning a Specialty.

  
**PRENTISS' PAT. VISES,**  
Adjustable Jaw.  
Stationary or Pat. Swivel Bottoms.  
ADAPTED TO ALL KINDS OF VISE WORK. ALSO  
"PEERLESS" SWIVEL PIPE GRIP,  
FITS ANY VISE. SOLD BY THE TRADE.  
**PRENTISS VISE CO.,**  
23 Day Street, New York.  
SOLE PROPRIETORS. SEND FOR CIRCULAR

**THE CLARK MFG CO.** MANUFACTURERS OF  
BUILDERS' HARDWARE  
BUFFALO, N. Y.

**V. G. HUNDLEY,**  
PROPRIETOR OF  
**NORTH CAROLINA HANDLE CO.**  
  
MANUFACTURER OF  
**Handles and Spokes,**  
73 Reade Street and 97 Chambers Street, NEW YORK.  
HARDWARE COMMISSION MERCHANT.

**RHODE ISLAND HORSE SHOE CO.,**  
MANUFACTURERS OF  
**Horse, Mule & Snow Shoes of the Perkins Pattern.**  
Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.  
F. W. CARPENTER, President C. H. PERKINS, Gen'l Manager. R. W. COMSTOCK, Secretary.

**CHAMPION HOG RINGER**  
RINGS and HOLDER.  
Only double ring ever invented. The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.  
Ringers 75c. Rings, 50c. 100. Holders, 75c. Huskers, 10c.  
**CHANDERS, BERING & QUINLAN,** Exclusive Manufacturers, Decatur, Ill.

  
**BUTLER & COLDEY MFG. CO., Limited,**  
MANUFACTURERS OF  
**Hardware and Machinist Tools,**  
Factory, ARLINGTON, N. J., P. O. Box 1909. Office, 97 Chambers St., NEW YORK.

**PERFECTION**  
**WINDOW CLEANER.**



**CAUTION, IMPORTANT.**

The great demand for and rapid increase in the popularity of the **PERFECTION WINDOW CLEANER** has influenced unprincipled parties to offer for sale an inferior and worthless imitation. We therefore caution all such persons and the trade generally against the manufacture, sale or use of any RUBBER WINDOW CLEANER not bearing our stamp, as all others are infringements, against which we shall protect ourselves under the rights granted us in U. S. Patents to the full extent of the law.

The only perfect glass or Window Cleaner yet devised. Has been constructed with a combination of an Elastic Cleaning Edge, and a yielding cushion or support. We own all the patents embodying one or both of these principles, and, by combining them, offer you a perfect Window Cleaner. They are made of the very best material, and are cheap, useful and durable.

Beware of all inferior and fraudulent imitations. Buy only the "PERFECTION," and you escape all infringements.

**PERFECTION WINDOW**  
**CLEANER CO.,**

232 La Salle St., CHICAGO, ILL.

**BARNES'**  
Patent Foot and Steam Power Machinery. Complete outfits for Actual Workshop Business. Lathes for Wood or Metal, Circular Saws, Scroll Saws, Formers, Mortisers, Tenoners, &c. &c. Machines on trial if desired. Descriptive Catalogue and Price List free.  
W. F. & JOHN BARNES, Rockford, Ill.  
No. 205 Main St.

  
**Grindstones, Emery, &c.**  
The world-renowned Dunderberg's Igniting Match Cases. The acme of perfection. No plating. No imitation. A fine nickel silver, 5 cents; solid Britannia silver, 25c. Samples sent free on receipt of price. Post stamps taken. F. S. DANGERFIELD, Sole Mfr., Auburn, N. Y., U. S. A. Goodness by first-class dealers.

**Walter R. Wood,**

**GRINDSTONES.**  
Berea, O., Nova Scotia, & other brands.  
283 and 285 Front Street, New York.

**GEO. CHASE,**  
The largest manufacturers in the world of  
**OIL STONE**  
Of all description.  
107th Street and Harlem River.  
Send for Illustrated Catalogue, List. NEW YORK.

**McDERMOTT & BEEBE STONE CO.**  
ALL SIZES & GRADES  
SEND FOR PRICES  
**GRINDSTONES**  
CLEVELAND, O.

**OHIO GRINDSTONE COMPANY,**  
H. H. CLOON, Pres. J. M. WORTHINGTON, Secy  
JAMES NICHOLL, V. P. E. K. MURPHY, Treas.  
Manufacturers of

**GRINDSTONES**  
Of All Kinds.  
127 Superior Street,  
CLEVELAND, 10.







**Shovel Irons.**  
Genuine Emerson..... \$10.00  
Badger's (not Emerson)..... \$10.00  
Imitation Emerson..... \$10.00  
Hunt's..... \$10.00  
Chapman..... \$10.00  
Saulnier..... \$10.00  
Torrey's..... \$10.00

**Rivets.**  
Iron and Tinned, new list, Dec. 10, 1887..... \$10.00  
In bulk, new list, Dec. 10, 1887..... \$10.00  
Copper Rivets and Burrs..... \$10.00

**Rivet Sets.**  
Nos. 7 8 9 10 11 12 13 14 15  
\$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00

**Rods.**  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00

**Rollers.**  
Barn Door, Sargent's list..... \$10.00  
Acme (Anti-Friction)..... \$10.00

**Rop.**  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00

**Sand Paper.**  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00

**Shank Pins.**  
Common..... \$10.00  
Silver Lake, Hemp..... \$10.00  
Silver Lake, Hemp..... \$10.00

**Shank Locks.**  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00

**Shank Weights.**  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00

**Shank Stuffers or Fillers.**  
Miles..... \$10.00  
Miles..... \$10.00  
Miles..... \$10.00

**Saws.**  
Dixton's Circular, Mill and Cross Cut..... \$10.00  
Dixton's Circular, Mill and Cross Cut..... \$10.00  
Dixton's Circular, Mill and Cross Cut..... \$10.00

**Scissors.**  
Hatch, Counter, No. 171..... \$10.00  
Hatch, Counter, No. 171..... \$10.00  
Hatch, Counter, No. 171..... \$10.00

**Scrapers.**  
Adjustable Box Scraper (R. & L. Co.), \$2.50, dis 20%..... \$10.00  
Adjustable Box Scraper (R. & L. Co.), \$2.50, dis 20%..... \$10.00  
Adjustable Box Scraper (R. & L. Co.), \$2.50, dis 20%..... \$10.00

**Screw Drivers.**  
Douglas Mfg. Co..... \$10.00  
Douglas Mfg. Co..... \$10.00  
Douglas Mfg. Co..... \$10.00

**Screws.**  
Flat Head Iron, new list, Dec. 27, 1887..... \$10.00  
Flat Head Iron, new list, Dec. 27, 1887..... \$10.00  
Flat Head Iron, new list, Dec. 27, 1887..... \$10.00

**Screw Window Balances.**  
R. H. Huggins's, No. 1, \$2.10; No. 2, \$1.75; No. 3, \$1.50..... \$10.00  
R. H. Huggins's, No. 1, \$2.10; No. 2, \$1.75; No. 3, \$1.50..... \$10.00  
R. H. Huggins's, No. 1, \$2.10; No. 2, \$1.75; No. 3, \$1.50..... \$10.00

**Shovels and Tongs.**  
Iron and Brass Head, R. & L. list..... \$10.00  
Iron and Brass Head, R. & L. list..... \$10.00  
Iron and Brass Head, R. & L. list..... \$10.00

**Shovel Irons.**  
Genuine Emerson..... \$10.00  
Badger's (not Emerson)..... \$10.00  
Imitation Emerson..... \$10.00

**Rivets.**  
Iron and Tinned, new list, Dec. 10, 1887..... \$10.00  
In bulk, new list, Dec. 10, 1887..... \$10.00  
Copper Rivets and Burrs..... \$10.00

**Rivet Sets.**  
Nos. 7 8 9 10 11 12 13 14 15  
\$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00

**Rods.**  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00

**Rollers.**  
Barn Door, Sargent's list..... \$10.00  
Acme (Anti-Friction)..... \$10.00

**Rop.**  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00

**Sand Paper.**  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00

**Shank Pins.**  
Common..... \$10.00  
Silver Lake, Hemp..... \$10.00  
Silver Lake, Hemp..... \$10.00

**Shank Locks.**  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00

**Shank Weights.**  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00

**Shank Stuffers or Fillers.**  
Miles..... \$10.00  
Miles..... \$10.00  
Miles..... \$10.00

**Shovel Irons.**  
Genuine Emerson..... \$10.00  
Badger's (not Emerson)..... \$10.00  
Imitation Emerson..... \$10.00  
Hunt's..... \$10.00  
Chapman..... \$10.00  
Saulnier..... \$10.00  
Torrey's..... \$10.00

**Rivets.**  
Iron and Tinned, new list, Dec. 10, 1887..... \$10.00  
In bulk, new list, Dec. 10, 1887..... \$10.00  
Copper Rivets and Burrs..... \$10.00

**Rivet Sets.**  
Nos. 7 8 9 10 11 12 13 14 15  
\$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00

**Rods.**  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00

**Rollers.**  
Barn Door, Sargent's list..... \$10.00  
Acme (Anti-Friction)..... \$10.00

**Rop.**  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00

**Sand Paper.**  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00

**Shank Pins.**  
Common..... \$10.00  
Silver Lake, Hemp..... \$10.00  
Silver Lake, Hemp..... \$10.00

**Shank Locks.**  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00

**Shank Weights.**  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00

**Shank Stuffers or Fillers.**  
Miles..... \$10.00  
Miles..... \$10.00  
Miles..... \$10.00

**Saws.**  
Dixton's Circular, Mill and Cross Cut..... \$10.00  
Dixton's Circular, Mill and Cross Cut..... \$10.00  
Dixton's Circular, Mill and Cross Cut..... \$10.00

**Scissors.**  
Hatch, Counter, No. 171..... \$10.00  
Hatch, Counter, No. 171..... \$10.00  
Hatch, Counter, No. 171..... \$10.00

**Scrapers.**  
Adjustable Box Scraper (R. & L. Co.), \$2.50, dis 20%..... \$10.00  
Adjustable Box Scraper (R. & L. Co.), \$2.50, dis 20%..... \$10.00  
Adjustable Box Scraper (R. & L. Co.), \$2.50, dis 20%..... \$10.00

**Screw Drivers.**  
Douglas Mfg. Co..... \$10.00  
Douglas Mfg. Co..... \$10.00  
Douglas Mfg. Co..... \$10.00

**Screws.**  
Flat Head Iron, new list, Dec. 27, 1887..... \$10.00  
Flat Head Iron, new list, Dec. 27, 1887..... \$10.00  
Flat Head Iron, new list, Dec. 27, 1887..... \$10.00

**Screw Window Balances.**  
R. H. Huggins's, No. 1, \$2.10; No. 2, \$1.75; No. 3, \$1.50..... \$10.00  
R. H. Huggins's, No. 1, \$2.10; No. 2, \$1.75; No. 3, \$1.50..... \$10.00  
R. H. Huggins's, No. 1, \$2.10; No. 2, \$1.75; No. 3, \$1.50..... \$10.00

**Shovels and Tongs.**  
Iron and Brass Head, R. & L. list..... \$10.00  
Iron and Brass Head, R. & L. list..... \$10.00  
Iron and Brass Head, R. & L. list..... \$10.00

**Shovel Irons.**  
Genuine Emerson..... \$10.00  
Badger's (not Emerson)..... \$10.00  
Imitation Emerson..... \$10.00

**Rivets.**  
Iron and Tinned, new list, Dec. 10, 1887..... \$10.00  
In bulk, new list, Dec. 10, 1887..... \$10.00  
Copper Rivets and Burrs..... \$10.00

**Rivet Sets.**  
Nos. 7 8 9 10 11 12 13 14 15  
\$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00 \$10.00

**Rods.**  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00  
Steel, Brass, Wrought..... \$10.00

**Rollers.**  
Barn Door, Sargent's list..... \$10.00  
Acme (Anti-Friction)..... \$10.00

**Rop.**  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00  
Manila, 1/4 inch and larger..... \$10.00

**Sand Paper.**  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00  
Bader & Adamson's Flint, 2 1/2 x 3..... \$10.00

**Shank Pins.**  
Common..... \$10.00  
Silver Lake, Hemp..... \$10.00  
Silver Lake, Hemp..... \$10.00

**Shank Locks.**  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00  
Clark's, No. 1, \$10.00; No. 2, \$8.00 per gross..... \$10.00

**Shank Weights.**  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00  
Solid Eyes, in 50 lb lots and over..... \$10.00

**Shank Stuffers or Fillers.**  
Miles..... \$10.00  
Miles..... \$10.00  
Miles..... \$10.00

AN IMPROVED  
LEVELING INSTRUMENT.



PRICE OF INSTRUMENT COMPLETE, \$20.  
Adapted to the use of Architects, Engineers, Masons, Builders, Farmers and others.

A NEW LEVELING ROD.  
This rod is round and made in two sections; it is united by a solid screw joint, as if of one length, and has a target. There are two scales, one side being Engineers' (feet, inches and tenths) the other Architects' (feet, inches and eighths). Price, \$6.

W.M. T. COMSTOCK, Manufacturer,  
6 Astor Place, New York.  
Circulars and discount to hardware trade furnished to dealers sending their card.

The Iron-Masters'  
LABORATORY.

Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestones, Slags and Coal for Practical Metallurgical Purposes.  
No. 339 Walnut St., Philadelphia.  
With Branch at Warrenton, Virginia.  
J. BLODGETT BRITTON.

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.  
For determining the per cent. of Pure Iron in an ordinary Ore..... \$4.00  
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50  
For each additional constituent of usual occurrence..... 1.50  
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.  
For determining the per cent. of Sulphur or Phosphorus in iron or steel..... 7.00  
For each additional constituent of usual occurrence..... 6.00  
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone..... 10.00  
For each additional constituent..... 2.00  
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12.50  
For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charge will correspond with those for the constituents of an ore.  
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.  
Printed instructions for obtaining proper average samples for analysis furnished upon application.

Self-Binders for The Iron Age



We are now prepared to supply our subscribers with an excellent self-binder for their papers, a cut of which is annexed. We call attention to the low prices at which it is offered. Address all orders to  
DAVID WILLIAMS,  
43 Reade Street, New York.

COVERINGS.

The Best Boiler and Pipe Covering Made!



TOOPE'S PATENT ASBESTOS-LINED REMOVABLE COVERING, made of felt and asbestos, for use on STEAM BOILERS and PIPES, Refrigerators, Meat Cans, Ice Houses and Hot and Cold Water Pipes. Easily applied by any one.

NATIONAL STEEL TUBE CLEANER for cleaning Boiler Tubes. Saves its cost every time it is used, and is endorsed by the best engineers.

ASBESTOS MATERIALS, FIBRE, MILLBOARD, PACKING AND CEMENT.  
Address CHALMERS SPENCE CO., 23 John St., N. Y.

AXE, PICK, SLEDGE AND HAMMER HANDLES, KNOXVILLE, TENNESSEE.

ALEXANDER BROS. BEST OAK BELTING PHILADELPHIA.

Elizabethport Steam Cordage Co., MANUFACTURERS OF MANILA, SISAL AND TARRED CORDAGE OF ALL KINDS. BINDER TWINE A SPECIALTY.

40 South Street, New York, E. M. FULTON, D. B. WHITLOCK, A. W. LUKENS.

S. H. & E. Y. MOORE.

163 & 165 LAKE ST., CHICAGO

AGENTS FOR  
PROVIDENCE TOOL CO.,

Wm. H. Haskell & Co., The Pennsylvania Bolt and Nut Co., Hotchkiss & Upson Co., Black Diamond File Works, Syracuse Bolt Co., Saranac Horse Nail Company, Columbus Bolt Works, Penn'd Block Co.

MANUFACTURERS OF

Bolts, Nuts, Washers,

GIMLET POINT COACH SCREWS, THRESHING MACHINE TEETH.

Wood Screws, Files, Horse Nails, Rope and Iron Strapped Blocks, Iron Tackle Blocks, Turn Buckles, Ship Chandlery Hardware, &c.

Also Manufacturers of

Climax Barn Door Hangers, Baggage Car Door Hangers, Sliding Door Sheaves, FREIGHT CAR DOOR ROLLERS AND HANGERS.

Moore's Differential Pulley Blocks, MOORE'S

Hand Hoists

WITH LOCK BRAKE, For Stores, Factories, Mills, Builders, Contractors, &c.

These Hoists are specially constructed to raise heavy weights with ease and rapidity. They can be suspended from any beam or bar, and fitted to lift any height. They are Simple, Durable and Powerful. The Lock Brake will hold the load suspended in any position.

We make these Hoists in two sizes, 600 pound size and 1200 pound size.

Send for Price List.

S. H. & E. Y. MOORE, 163 & 165 Lake St., Chicago.

JEWETT'S PATENT PORTABLE FILTER

First—A Portable Vessel (galvanized iron) containing the filtering medium. Second—An Outer Case, fitted to receive said vessel with cover. Third—A Porcelain-lined Water Cooler.

The whole exterior is fitted up in harmony and will last a lifetime. Whenever the filter part gives out, a new filtering vessel can be obtained at a trifling cost, which will make the whole the same as new. This is a genuine, useful and beautiful novelty. Sold by the trade everywhere. Send for circular.

JOHN C. JEWETT & SONS, Buffalo, N. Y.

Send for Circular.

NEARLY the whole front is a wheel with perches. The bird hopping from perch to perch exercises to the bird, amusement and delight to the beholder. This cage is a genuine, useful and beautiful novelty. Sold by the trade everywhere. Send for circular.

JOHN C. JEWETT & SONS, Buffalo, N. Y.

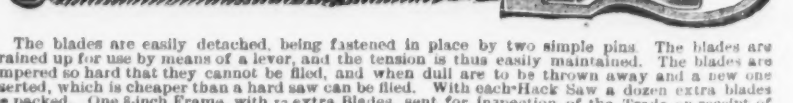
Send for Circular.

NEARLY the whole front is a wheel with perches. The bird hopping from perch to perch exercises to the bird, amusement and delight to the beholder. This cage is a genuine, useful and beautiful novelty. Sold by the trade everywhere. Send for circular.

JOHN C. JEWETT & SONS, Buffalo, N. Y.

GRIFIN'S IMPROVED HACK SAW.

For Sawing Brass, Iron, Steel, Lead Pipe and Metals of all Kinds.



The blades are easily detached, being fastened in place by two simple pins. The blades are strained up for use by means of a lever, and the tension is thus easily maintained. The blades are tempered so hard that they cannot be filed, and when dull are to be thrown away and a new one inserted, which is cheaper than a hard saw can be filed. With each Hack Saw a dozen extra blades are packed. One 8-inch frame, with 12 extra blades, sent for inspection of the Trade on receipt of \$1.50 each, postage prepaid.

FOR SALE GENERALLY BY THE HARDWARE TRADE OF THE UNITED STATES.

C. E. JENNINGS & CO., 96 Chambers St., N. Y.

MCCULLOUGH, WOODBURY & CO., MANUFACTURERS OF

AXE, PICK, SLEDGE AND HAMMER HANDLES, KNOXVILLE, TENNESSEE.

ALEXANDER BROS. BEST OAK BELTING PHILADELPHIA.

Elizabethport Steam Cordage Co., MANUFACTURERS OF MANILA, SISAL AND TARRED CORDAGE OF ALL KINDS. BINDER TWINE A SPECIALTY.

40 South Street, New York, E. M. FULTON, D. B. WHITLOCK, A. W. LUKENS.







ESTABLISHED 1823.

TRADE MARK "BLUE STONE."

THE LARGEST MANUFACTURER IN THE WORLD OF  
STONES FOR SCYTHES, AXES AND  
TURPENTINE HACKS, &c.

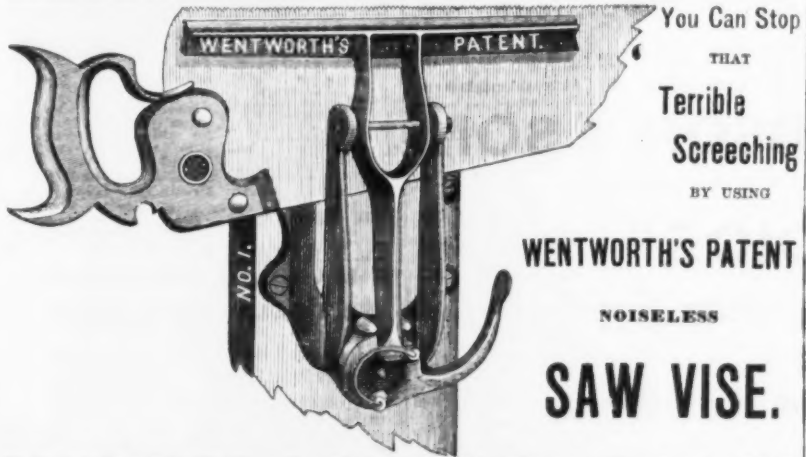


Twenty quarries from which I obtain the large variety of Choice Grits. I can furnish Stones, that will quickly give a Keen, Sharp Edge, and strong enough not to break.

I Make the Celebrated INDIAN POND (RED END), PREMIUM QUINEBAUGH, WHITE MOUNTAIN, DIAMOND GRIT, MAGIC, GILT EDGE, LAMOILLE, WILLOUGHBY LAKE, GREEN MOUNTAIN, MOWING MACHINE, RAGG, AMERICAN GERMAN PATTERN, BLACK DIAMOND, BOSS HACKER, VERMONT CHOCOLATE, BLACK DIAMOND AXE BITTS.

No goods sold to Retail Trade. Correspondence solicited from the Wholesale Trade, who will find satisfaction and profit in handling my goods.

A. F. PIKE,  
PIKE STATION, N. H., U. S. A.

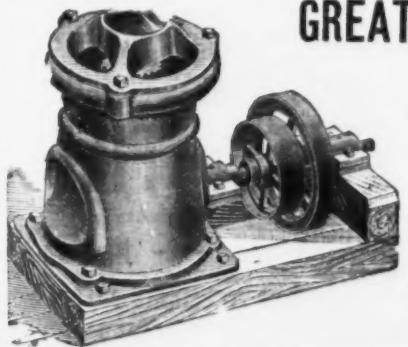


It has a Flexible Rubber Cushion or Muffler between the Jaws, which prevents any vibration, and renders Saw Filing Noiseless.

We guarantee it to make no more noise than filing on a solid piece of iron. The jaws are 10 inches long, and are made to open and close by simply turning the Cap Lever. It is strong, well proportioned and handsomely finished; can be easily secured with screws to a workbench or any place desired. Just what every carpenter and saw filer wants. Packed in cases of one and two dozen. With the first order of one dozen we will furnish you a handsome Sample Stand free.

No. 1.—(10 inch Jaws)—Per Dozen, \$15.00  
A LIBERAL DISCOUNT TO THE TRADE.

SENECA MFG. CO., Seneca Falls, N. Y., U. S. A.



GREATEST ROCK BREAKER  
ON EARTH.

CAPACITY 1 A TON A MINUTE.  
DON'T FORGET IT.  
Guaranteed to do Double the Work of any other or Money Refunded.

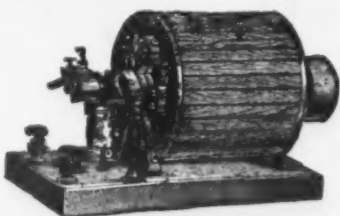
SEND FOR CIRCULARS.  
ALSO  
Engines, Boilers, Stamp Mills and Mining Machinery.

GATES IRON WORKS,  
52 Canal St., Chicago.

THE  
AMERICAN DYNAMO-ELECTRIC MACHINE,  
For Electro-Plating, Electrotyping, &c.

Requires no Water.

Combining  
all the



Latest  
Improvements.  
Cannot Reverse  
Current.

The Zucker & Levett Chemical Co.,  
GENERAL AGENTS,

Manufacturers and Importers of NICKEL PLATERS' SUPPLIES.

540, 542, 544 & 546 WEST 16TH STREET, N. Y.



IMPROVED SHEET IRON ROOFING.

Best quality and simplest plan in use

T. C. SNYDER & CO., Canton, Ohio.

Cheaper, stronger, and less liable to get out of repair than tin. Any mechanic can apply it. Sample Circular and Price List free by mail at request.

Also, Agents for LOWE'S METALLIC PAINT Best and Cheapest in the World.

NOVELTY IRON FOUNDRY,  
HAIGHT & CLARK,  
16 & 18 DeWitt Street, ALBANY, N. Y.,  
MANUFACTURERS OF FINE GRAY IRON CASTINGS  
OF EVERY DESCRIPTION.  
Patterns and Pickets for Wire Workers, Castings for Furniture and Piano Manufacturers. Iron and Metal Patterns of all kinds a specialty. Correspondence solicited.  
JAPANNING. BRONZING.

John T. Lewis & Bros.  
No. 231 South Front St.,  
PHILADELPHIA.



TRADE MARK.  
MANUFACTURERS OF  
Pure White Lead, Red Lead, Litharge,  
Orange Mineral, Linseed Oil,  
AND PAINTERS' COLORS.

Brooklyn White Lead Co



White Lead, Red Lead & Litharge.  
No. 182 Front Street,  
NEW YORK.

JOHN JEWETT & SONS  
Manufacturers of the well-known brand of  
WHITE LEAD.



TRADE MARK  
ALSO MANUFACTURERS OF  
LINSEED OIL.  
181 Front Street, NEW YORK.



The Atlantic White Lead and  
Linseed Oil Co.,  
Manufacturers of  
White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;  
LINSEED OIL,  
Raw, Refined and Boiled.  
ROBERT COLGATE & CO.,  
287 Pearl St., NEW YORK.

SALEM LEAD COMPANY,  
CORRODERS AND MANUFACTURERS OF  
PURE WHITE LEAD.



ALSO MANUFACTURERS OF  
Lead Pipe and Narrow Sheet Lead.  
F. A. BROWN, Treas. SALEM, MASS.

VARIETY METAL BOOM.  
Iron Foundry and Machine Shop.  
STEAM HEATING BY DIRECT RADIATION in all its Branches a Specialty. Brass and other Metal Moulding, Casting and Finishing. Noiseless Vertical Engines, Hydrants, Fire Plugs, &c.  
FRAS. B. BANNAN,  
Pottsville, Schuylkill Co., Pa.

CROTON MAGNETIC IRON MINES.  
THEALL MINES. McCOLLUM MINES.  
BREWSTERS, Putnam Co., N. Y.

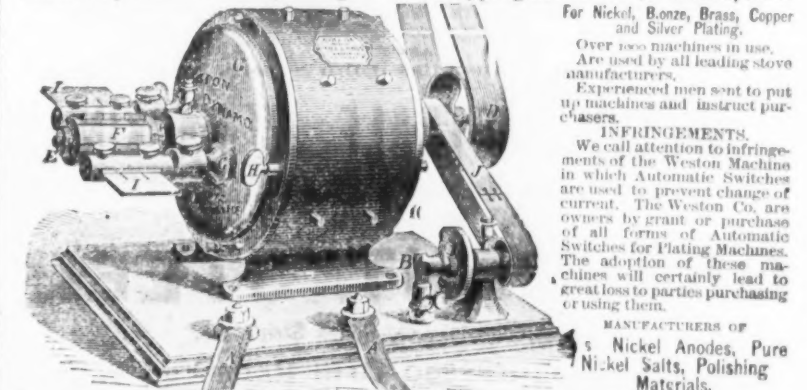
AVERAGE ANALYSIS.

Per-oxide Iron	50.59	Silica	15.70
Protoxide Iron	23.02	Carbonic Acid	
Protoxide Manganese	3.32	Phosphoric Acid	.37
Alumina	3.27	Titanic Acid	
Magnesia	.76	Sulphur	.58
Lime	1.65	Soda	
		Water, &c.	
			53.31
Metallic Iron			.24
Metallic Manganese			.16
Phosphorus			

THE CROTON MAGNETIC IRON MINES are now ready to contract for next year's delivery of their superior Magnetic Iron Ores, delivered at Port Morris, New York City or on the line of New York and New England Railroad, Erie Railroad and connections. The ores are guaranteed to yield 50 % Metallic Iron.

W. E. RIDER, Genl. Manager. OFFICE, 29 PARK ROW, N. Y. City. JOHN H. CHEEVER Pres. J. D. CHEEVER, Treas.

HANSON, VAN WINKLE & CO., Sole Agents for  
Veston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.



For Nickel, Bronze, Brass, Copper and Silver Plating.  
Over 1000 machines in use. Are used by all leading stove manufacturers. Experienced men sent to put up machines and instruct purchasers.  
INFRINGEMENTS.  
We call attention to infringements of the Weston Machine in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.  
MANUFACTURERS OF  
Nickel Anodes, Pure Nickel Salts, Polishing Materials.

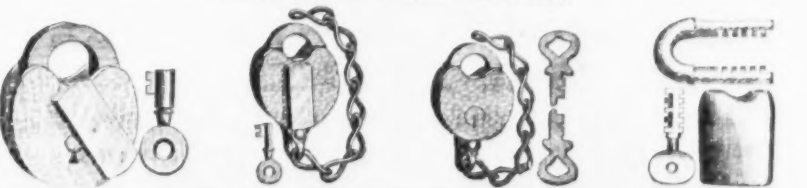
Manufactory, Newark, N. J. New York Office, 92 & 94 Liberty St.

NASHVILLE SPOKE & HANDLE CO.,  
NASHVILLE, TENN.  
MANUFACTURERS OF  
AXE, PICK, SLEDGE, HAMMER AND OTHER  
HICKORY HANDLES.

Also CARRIAGE and WAGON SPOKES.  
In order to meet the requirements of our Export Trade, we carry at our Factory a stock of 20,000 doz. Handles and 500,000 Spokes.

GILBERT PARKER, Sole Agt.  
128 CHAMBERS STREET, New York City.

BRASS, MALL IRON AND SCANDINAVIAN  
PADLOCKS,  
Manufactured by JOHN J. TOWER, 96 Chambers St., New York.  
BEST QUALITY. LARGE VARIETY.  
Railroad and other Padlocks made to order.



GEO. M. SCOTT,  
Bellows Manufacturer,  
Johnson Street,  
Cor. 22d St.,  
CHICAGO, ILL.

RIVETS C. F. HARRISON, RIVETS  
BOILER, BRIDGE & TANK  
CUYAHOGA FALLS, OHIO.

ENAMEL PAINT CO.,  
WITHROW & GORDON,  
Engineers & Contractors  
PITTSBURGH, PA.

WHITWELL  
HOT BLAST STOVES.  
OVER 600 IN USE.

The following parties either have them in use under construction

WM. McFARLAND  
Iron and Brass Founder,  
TRENTON, N. J.  
Chilled Cast Wire Dies a Specialty.  
Any size or style made at short notice.  
GRAY IRON CASTINGS.  
JOHN KEPPELMAN, Reading, Pa.  
Herewith gives notice that he has opened a Jobbing Foundry, and is ready to receive orders for all kinds of Light Gray Iron Castings; also, for every description of Machinery. Orders promptly filled. Please address  
JOHN KEPPELMAN, Cor. 2d and Court Sts., Reading, Pa.



# R. H. WOLFF & CO., MANUFACTURERS OF STEEL WIRE FOR ALL PURPOSES.

**Special Finest CAST STEEL WIRE.**  
Market Steel Wire, Prime Coppered Spring Wire, Tempered and Untempered Steel Wires, in Long Lengths, for Crinoline, Corset, Lock and Brush Makers, and all Special Purposes.

**ALL KINDS OF FURNITURE SPRINGS.**  
IMPORTERS OF  
**IRON, STEEL, & RAILS** of Every Description.  
Wire Rods, Plain and Galvanized Wires, &c., Gun Barrels, Moulds, and Ordnance.

Shipments in bond from American Ports, and direct from Europe to all parts of the World.  
**EXPORTERS AND GENERAL MERCHANTS.**

WORKS, PEESKILL, N. Y.  
Agents of the **ALLIS PATENT STEEL BARBED FENCE.**



GALVANIZED TWISTED FENCE STRIP.

Office and Warehouse, 93 John Street, New York.

# MILLER, METCALF & PARKIN, Pittsburgh, Pa., Manufacturers of

# CRESCENT STEEL,

In Bars, Sheets, Cold-Rolled Strips, &c.

Polished, Compressed Drill Rods and Wire.

Warranted equal to any imported in quality, finish and accuracy.

Also Common Grades.

# J. & RILEY CARR,

SHEFFIELD  
England.  
ESTABLISHED 1810.

Sole Importers and Manufacturers of the  
**Celebrated "Dog Brand"**  
**FILES AND RASPS.**

EVERY FILE

WARRANTED "HAND CUT"

And made from our own CAST STEEL, specially manufactured for the purpose. A large and well-assorted stock on hand or promptly imported to order. Also

**SUPERIOR STEEL**  
for Lathe Tools, Granite Rock Drills, Chisels, Masons' and Miners' Tools, Files, Cutters and Edge Tools.

**SHEET CAST STEEL,** for Cotton Ginsaws, Knives, Lock and other Springs, Saws, Cutters, Machine Knives, Stamping Cold, &c.

**BRIGHT COLD ROLLED STEEL,** for Clock, Lock, Corset and other Springs, Keys, Stamping Cold, &c.

**SWEDS SPRING,** German, Machinery and all other descriptions for agricultural and machinist purposes.

**PATENT SOLID WROUGHT IRON ANVILS.**

Warehouse, 30 Gold St. (near John St.), NEW YORK.

# S. & C. WARDLOW,

Sheffield, England,

Manufacturers of the Celebrated

# Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

Warehouse, 95 John Street, New York.

WILLIAM BROWN, Representative.

# Cleveland Rolling Mill Co.,

Manufacturers of

# BESSEMER STEEL

AND

# Iron Rail and Fastenings, SPRING STEEL

AND

# WIRE OF ALL KINDS,

Tire, Axles and other Forgings,  
Boiler Plate, Galvanized and Black Sheet Iron, Corrugated Roofing and Siding of Siemens-Martin, Bessemer Steel and Iron.

CLEVELAND, OHIO.

Western Agency,

New England Agency,

91 Lake Street, Chicago.

239 Franklin Street, Boston.

N. D. PRATT, Agent.

JOHN WALES & CO., Agents.

# THE MIDVALE STEEL CO., NICETOWN, PHILADELPHIA.

Best Warranted Cast Steel for Machinists' Tools,

Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills,

Extra Mild Center Steel, special for Taps;

Also,

MACHINERY AND CAST SPRING STEEL HEAVY AND LIGHT FORGINGS.

Warehouse, No. 12 North 5th St., Philadelphia.

Address A. M. F. Watson, General Sales Agent.

# STEEL

Gautier Steel.

See Page 3.

# LABELLE STEEL WORKS.

# SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

# STEEL.

Also Springs, Axles, Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, PITTSBURGH, PA.

Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO., 611 and 613 Market St.; at Cleveland by CONNITT, WICK & CO., 113 Water St.

# ALBANY & RENSSLAER IRON & STEEL CO., TROY, N. Y., MANUFACTURERS OF

# BESSEMER STEEL RAILS,

FISH PLATES, BOLTS, NUTS, SPIKES, &c.

Machinery Steel, Merchant and Ship Iron.

CHESTER GRISWOLD, Vice-President, - 56 Broadway, New York City.

# BOND, PARSONS & CO.,

104 John St., NEW YORK.

224 So. 3d St., PHILADELPHIA.

AMERICAN AND FOREIGN PIG IRON,

Spiegeleisen, Blooms, Rails, Wire Rods, &c.

TIN PLATES.

VIVIAN, YOUNGER & BOND, London & Birmingham.

# FRANCIS HOBSON & SON,

97 John Street, NEW YORK.

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

# GEO. SANDERSON & CO.,

MANUFACTURERS AND

# Importers of STEEL,

Removed to 30 Gold Street, New York.

Particular attention is paid to quality and temper for FILES, SAWS, EDGE TOOLS, TABLE AND POCKET CUTLERY, TOOLS, TAPS AND DIES; also for COLD ROLLED STEEL for CLOCK SPRINGS, CORSET CLASPS, &c.

A Large Assorted Stock of JOHN ROTHERY'S FILES always on hand.

Warranted Superior to any Steel in the Market, either English or American, for every purpose.

Also,  
Combination Chrome Steel and Iron for  
Safes, Jails and Deposit Vaults.

Send for Circular  
and  
Price List

Chrome Steel Works

Kent Avenue and Keap Street,  
BROOKLYN, E. D., N. Y.

Chicago Branch,

S. D. KIMBARK, Agent.

Cincinnati Branch,  
123 Central Avenue,

# GUTE HOFFNUNG'S HUTTE,

(Works of Good Hope.)

Established 1781.

OBERHAUSEN, ON RUHR.

8500 men employed.

BRAND:

# G. H. H.

STEEL RAILS,

STEEL WIRE RODS,

STEEL BLOOMS,

SPIEGELEISEN,

FERROMANGANESE UP TO 80 PER CENT.

GODEFFROY & CO., Sole Agents for the United States,

43 New Street, NEW YORK.

# CROWN STEEL,

CASSIDY & CO., Mfrs., Pittsburgh, Pa.

WARRANTED EQUAL TO ANY PRODUCED.

Best refined Cast Steel, for Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear Knives, Cold Chisels and Machinists' Tools. Also Machinery Steel and Forgings.

HICKS & DICKEY, Gen'l Agents, 413 Commerce St., Philadelphia.

Represented in New York by F. L. Froment & Co., 112 John Street.

Represented in Boston by Bellows & Manson, 77 Oliver Street.

Represented in Atlanta, Ga., by Davenport, Johnson & Co.

# J. H. WEBSTER,

111 Bank St.,  
CLEVELAND, OHIO.

# LAWYER.

Prompt personal attention to collections, with immediate remittance. Refer to Wm. Bingham & Co.

# R. MUSHET'S Special Steel

FOR

# LATHES, PLANERS, &c.

Turns out at least double work by increased speed and feed, and cuts harder metals than any other steel. Neither hardening nor tempering required.

Sole Makers,

**SAMUEL OSBORN & CO.,**  
Sheffield, England.

Represented in the United States by

**B. M. JONES & CO.,**

Nos. 11 & 13 Oliver Street, BOSTON.

# NAYLOR & CO.,

99 John St., New York.

6 Oliver St., Boston, Mass.

208 S. Fourth St., Philadelphia, Pa.

IMPORTERS OF

**STEEL AND IRON RAILS,**

Tin and Terne Plates,

Swedish and Norway Iron,

BESSEMER STEEL WIRE RODS.

Pig Iron, Spiegeleisen, Ferromanganese, Scrap Steel and Old Iron Rails.

MANUFACTURERS OF

**STEEL COMPRESSED SHAFTING,**

"Benzon" Homogeneous Plates

For Boilers, Fire-boxes, &c.

Axles, Crank Pins, Spring Steel,

And all other kinds of

Martin-Siemens Steel and Iron

For Railroad purposes.



Anti-Rattler and Adjustable Thill Spring. Several reasons why it is better than any other made. No taking out shafts or pole to put in, and can tighten at any time.

Manufactured by Frank D. Kernechan, MIDDLETOWN, N. Y. For Sale by Wholesale and Retail Saddlery and Hardware dealers.

# THE VERONA TOOL WORKS.

**METCALF, PAUL & CO.,**

Manufacturers of

Solid Steel Mining and Railroad Picks,

Blacksmith's Sledges, Striking Hammers,

Woodchopper's Wedges and Sledges,

Mining, Quarry and Railroad Tools of the best material and workmanship only. All tools are stamped with our name and trade mark, and fully warranted.

Pittsburgh, Pa. Western Branch  
7th Avenue and  
Liberty Street. CHICAGO, ILL.,  
22 West Lake St.

# F. W. MOSS,

Sole Proprietor of the  
CELEBRATED AND OLD-ESTABLISHED  
BRANDS OF

# "MOSS" & "MOSS-GAMBLE'S" STEEL AND FILES

Office and Warehouse:

80 JOHN ST., - - New York.



EMPIRE NUT CO.

PITTSBURGH, PA.

Hot Pressed

NUTS.

Small Sizes a Specialty.

Established 1838.

Bevin Bros. Mfg.

Co.,

Easthampton, Ct.

Manufacturers of

SLEIGH BELLS,

House, Tea, Hand,

Gong Bells, &c.

Bell Metal Kettles.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

# A. PARDEE & CO.,

237 South Third Street,

PHILADELPHIA,

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

# Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz:

A. Pardee & Co.

Pardee, Bro. & Co.

Calvin Pardee & Co.

Pardee, Sons & Co., MT. PLEASANT.

HAZLETON,

CRANBURY,

SUGAR LOAF.

LATTIMER.

HOLLYWOOD.

MT. PLEASANT.



**CARNEGIE BROS. & CO., LIMITED,**  
THOS. M. CARNEGIE, Chairman. PITTSBURGH, PA. D. A. STEWART, Treasurer.

**EDGAR THOMSON STEEL WORKS DEPARTMENT.**  
Works at Bessemer Station, P. R. R.  
Branch Office and P. O. Address, 48 Fifth Ave.,  
MANUFACTURERS OF



OF SUPERIOR QUALITY.

**Union Iron Mills Department**

Mills at Thirty-third St. and A. V. R. R.  
Branch Office and P. O. Address, Thirty-third St.  
MANUFACTURERS OF

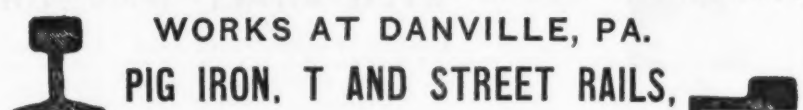
**STRUCTURAL IRON.**

Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees,  
Universal Mill Plates, Bar Iron, Light Steel and Iron Rails.  
Special attention given Unusual Shapes and Sizes.

Lithographs of sections and book of detailed information giving calculation of strain, &c., furnished to Engineers and Architects on application.

**NEW YORK OFFICE: Room 32, No. 55 Broadway, N. Y.**

**THE MONTOUR IRON & STEEL COMPANY.**



A general assortment of mine and narrow gauge rails kept on hand, from which shipments can be made promptly.  
W. E. C. COXE, President, Reading, Pa. S. W. INGERSOLL, Treasurer, 208 South Fourth St., Philadelphia, Pa.

**THE CLEVELAND CRUCIBLE STEEL CO.**  
Manufacturers of TOOL, MACHINERY, SPRING, TIRE, STEEL CLEVELAND, OHIO.  
Warranted equal to any made.

**PITTSBURGH BESSEMER STEEL CO. (LIMITED),**

**STEEL RAILS**  
LIGHT RAILS A SPECIALTY.

P. O. Address, 87 Wood Street, Pittsburgh, Pa.

**THOS. FIRTH & SONS, Limited, SHEFFIELD,**

**Crucible Cast Steel.**

**JERE. ABBOTT & CO.,**

AGENTS AND IMPORTERS OF

**SWEDISH IRON,**  
35 Oliver St., BOSTON. 23 Cliff St., NEW YORK.

W. J. LEWIS, Chairman. HENRY LLOYD, Secretary. M. D. W. LOOMIS, Treasurer.  
**LINDEN STEEL COMPANY, LIMITED.**

MANUFACTURERS OF  
**OPEN-HEARTH STEEL.**

Ingots, Blooms, Billets, Slabs, Spring, Tire, Rod, Agricultural and Other Steels.  
Correspondence in reference to special shapes, sizes and qualities specially solicited.

Office, No. 173 Wood St., PITTSBURGH, PA. Works, Linden Station, S. & O. R. R.

**GUSTAF LUNDBERG,**  
AGENT FOR

**N. M. HÖGLUND'S SONS & CO.,**  
OF STOCKHOLM,

**SWEDISH & NORWAY IRON,**

38 KILBY STREET, BOSTON.

ALBERT POTTS, Philadelphia Agent, 214 & 216 N. Front Street.

**ELBA IRON & BOLT CO., Limited.**  
MANUFACTURERS OF

**MERCHANT BAR IRON,**

Skelp Iron, Splice Bars, Railway Track Bolts, Car, Bridge, and Machinery Bolts, Nuts, &c.

We invite the attention of RAILROAD MEN especially to our make of SPLICE BARS and Track bolts. Using the best brands of REFINED IRON, and paying close attention to the finish of our manufactures, we are enabled to offer our patrons BOLTS, NUTS, SPLICE BARS &c., of excellent quality. Our works have been enlarged within a few years; all orders are now executed with promptness; all our work guaranteed.

SEND FOR PRICE LISTS AND INFORMATION TO

**ELBA IRON & BOLT CO. Limited, Pittsburgh, Pa.**  
LOVEJOY & DRAKE 49 Cortlandt Street New York Agents.

# THE IRONMONGER AND METAL TRADES ADVERTISER

Published Every Saturday, at 42 Cannon St., London, E. C

**SUBSCRIPTION, 20s. ABROAD, POST FREE**

including a Supplement in Four Languages every fourth week, and a handsome Diary at the end of the year.

**AMERICAN MANUFACTURERS**

AND

**AMERICAN EXPORTERS**

desirous of cultivating trade with Great Britain, the British Colonies, India and the Continent of Europe, should

**ADVERTISE IN THE IRONMONGER,**

which is in Great Britain and the Colonies what *The Iron Age* is in the United States.

**THE HALF-YEARLY SPECIAL ISSUE,**

with a guaranteed circulation of

**12,000 COPIES,**

every copy going to a live firm, will take place on March 3d, 1883.

## ADVERTISEMENTS

are inserted in the *Ironmonger and Metal Trades Advertiser* at the subjoined rates, from which no variation can be made on any ground whatever

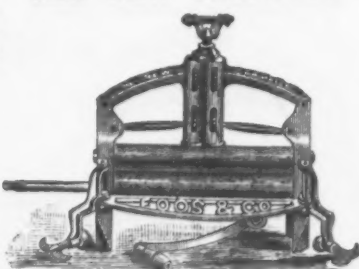
Size of Page—Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in the *Ironmongers' Diary and Text Book*, published toward the end of each year, and presented to every Subscriber.

	SPECIAL ISSUE ONLY, net.	53 INSERTIONS, each net.	27 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.
One page.....	Gold. \$60.00	Gold. \$20.00	Gold. \$22.50	Gold. \$25.00	Gold. \$30.00	Gold. \$35.00
Two-thirds page.....	45.00	15.00	16.90	18.75	22.50	26.25
Half page.....	33.00	11.00	12.40	13.75	16.50	19.25
One-third page.....	24.00	8.00	9.00	10.00	12.00	14.00
Quarter page.....	19.20	6.40	7.25	8.00	9.60	11.20
One-sixth page.....	13.50	4.50	5.10	5.65	6.75	7.85
One-eighth page.....	10.80	3.60	4.10	4.50	5.40	6.25
One-sixteenth page.....	6.00	2.00	2.25	2.50	3.00	3.50

Copy and Blocks, or Electros, should be sent off so as to reach London not later than February 27th, 1883. May be sent through *The Iron Age*.

## THE NEW CHAMPION



TUB and FOLDING BENCH WRINGERS.

**PURE WHITE RUBBER ROLLS,**  
Malleable Iron Castings.

Pressure obtained by means of pivoted levers acting on lower roll.

Undoubtedly the best principle ever used on a Wringer,

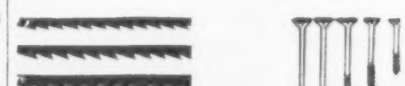
and secured by letters patent owned exclusively by us. Send for circulars, price list, &c.

**G. S. FOOS & CO.,**  
Springfield, Ohio.



**CLEVELAND IRON ORE PAINT COMPANY,**  
Manufacturers of  
**PURE IRON ORE PAINTS,**  
Red (Rosie) Purple and Brown.  
We guarantee all our Paints, and respectfully solicit the patronage of consumers and dealers. Send for Price List to  
2000, 79 Columbus St., Cleveland, O.

**BEST IRON PAINT.**



**Fret Saw Blades,**

**CARVING TOOLS, FINE SCREWS,**

SMALL ENGINE CASTINGS, GEARS, &c.,

Light and Fancy Hardware,

MACHINISTS' TOOLS, BICYCLES, SKATES.

In the line of Scroll Saw Materials, we carry the largest and best stock in the United States. In Saw Blades, Fine Screws and Files, Engraving and Carving Tools we represent the best manufacturers in Europe.  
The Wholesale and Retail Trade will do well to get our Prices. All quantities of Saw Blades at Bottom Figures, from 25 cents per gross up. We publish more Designs for Scroll Sawing than any other house in the world.

**The John Wilkinson Co.,**

77 & 79 STATE ST., CHICAGO.



# HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

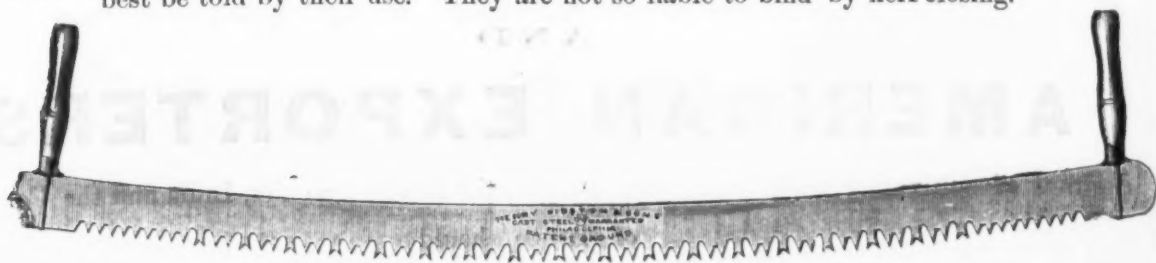
Front and Laurel Streets,

PHILADELPHIA.

## TRIUMPH.

NARROW CROSS CUT SAW, WITH HANDLES COMPLETE.

These Saws have been made by us for years, and their utility for cutting down trees can best be told by their use. They are not so liable to bind by kerf-closing.



Reversible Handles sent with these Saws if so Ordered, Otherwise Loop Handles will be sent.

### MAST, FOOS & CO., SPRINGFIELD, OHIO, U.S.A.



Send for Illustrated Circulars and Prices to Mast, Foos & Co., Springfield, O.

**CHAMPION Horse Nails,**

Manufactured from very best NORWAY METAL, that will not split nor flake, are accurately pointed, tough, strong and hold the shoes; soft enough to clinch readily, stiff enough to drive without bending. Every nail uniform and perfect. They are used in thousands of shops with best of satisfaction, and especially liked by "door-men" for their good reliable driving. Made in two patterns, "LARGE HEADS" and "CITY HEADS".

QUALITY IS FULLY GUARANTEED.

LIST:					
Nos. 5	6	7	8	9	10
28c.	25c.	23c.	22c.	21c.	20c.

CHAMPION HORSE NAIL CO., APPLETON, WIS.

**WROUGHT IRON TACKLE BLOCKS.**

Swivel Hooks for Rope or Chain, POLISHED GROOVES, ALL SIZES IN STOCK.

Also Pulley Blocks for Wire Rope,

Headquarters for the

**IRVING BRAND WOODEN PULLEY BLOCKS,**

**MCCOY & SANDERS, Manufacturers,**

26 Warren Street, New York.

**THE GLOBE MFG. CO., Middletown, Conn., U. S. A.**



**CHISELS & PLANE IRONS.**

A full line of Socket Framing and Socket Firmer Chisels, Socket Firmer Gauges, Cold Chisels, Box Chisels, Drawing Knives, "Hollow" Plane Irons, Harness Snaps, Washer Cutters, Butchers' Choppers and Cleavers, Pocket Wrenches, &c.

N. B.—This Company must not be mistaken for the late Globe Hardware Co., as we never had any connection whatever with them.

**J. E. QUACKENBUSH & SON**

MANUFACTURERS OF

Porcelain, Mineral & Jet Knobs & Escutcheons.

Send for Price List and Terms

OFFICE,

535 5th Ave., N. Y.



### BAILY PORTABLE HOIST.



Warranted double the power and not one-half the price of other hoists. As a proof of the above, I will give them 30 days on trial. Send for catalogue and price list.

Mr. James Dunn—Dear Sir: The Baily No. 3 portable hoist worked to our entire satisfaction. It lifted our fly wheel and shaft, weighing in all over 20 tons, and did its work easily. For a machine of its character, we do not think it has an equal. Yours truly M. C. Dow & Co., Proprietors National Flour Mills, 26 Merwin St., Cleveland, Ohio.

The hoist referred to by Messrs. Dow & Co. only weighs 10 lbs. Price \$100. I challenge any manufacturer in the country to bring on a hoist of the same weight and price as I lift such a load. Address J. DUNN 32 Bank Street, Cleveland, Ohio.

AGENTS IN ALL FOREIGN COUNTRIES.



**HOWSON'S PATENT OFFICES**

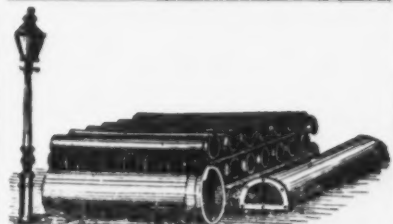
119 South Fourth Street, PHILADELPHIA

Branch Office, 605 Seventh St. Washington, D. C.

M. HOWSON, Engineer and Solicitor at Patent.

G. HOWSON, Attorney at Law and Counsel in Patent Cases.

SEND FOR CIRCULARS.



**R. D. WOOD & CO.,**

Philadelphia,

Manufacturers of

**Cast Iron Pipe**

FOR WATER AND GAS, Lamp Posts, Valves, &c., Mathew's Pat. Anti-Freezing Hydrants. 400 CHESTNUT STREET.



**Tree and Hedge Trimmer.**

Unsurpassed for cheapness and durability. Unlike any other make, it combines a perfect lever principle with a blade working in a slotted steel hook.

Send for illustrated circular and price list.

**E. S. LEE & CO.,**

164 West Main St., Rochester, N. Y.

MACHINERY FOR

Straightening and Cutting Wire

Of all Sizes to any Length.

Send for Catalogue.

**JOHN ADT,**

New Haven, Conn., U. S. A.



### Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FROM FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each pump.

Especially attention is called to the material and workmanship exhibited in these pumps.

LIST PRICE, \$8.

THE NEW ENGLAND BUTT CO.

PROVIDENCE, R. I.



NEW LINE.

WITH SHELL EJECTOR

30, 32, 38, and 44 Cal.

Pocket, Police, Navy and Army Sizes.

Also, Double and Single Shot Guns.

Rifles, Cartridges, Shells, Bullets,

Primers, Loading Instruments,

&c., &c.

Send for reduced catalogue and discounts of goods manufactured by

**E. REMINGTON & SONS,**

293 Broadway.

NEW YORK.

### MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,

Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,

BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL

PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER

AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS

DRILL GRINDING MACHINES. TAPER REAMERS, MILLING

CUTTERS AND SPECIAL TOOLS TO ORDER.

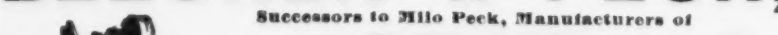
All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt. EDWARD S. TABER, Treas.



### BEECHER & PECK,

Successors to Milo Peck, Manufacturers of



**PECK'S DROP PRESS**

PECK'S DROP LIFTER is the only one which has its parts

cushioned. Being thus cushioned they are the most durable Lifter in

the market.

Can be attached to any drop now in use.

Send for Illustrated Catalogue.

Cor. Lloyd and River Sts., New Haven, Conn.

### GENERAL OFFICE and FACTORY, Cuyahoga Falls, O.

Gener'l New England Agents.

**JOHN WALES & CO.,**

239 & 241 Franklin St., BOSTON, MASS.

Western Agent: S. E. BLISS,

89 Lake Street, CHICAGO, ILL.

Louisville, Ky: BOYD, HUBBERT & JUSTI,

636 West Main St.

Cincinnati, Ohio: GEO. KINSEY & CO.,

Central Avenue.

### Armstrong's Improved Adjustable Stock and Dies

FOR PIPE AND BOLTS.



Tapped to the U. S. and Whitworth Standard Gauges. Adjustable to all variations in the size of

fittings. Can be resharpened without drawing the temper by simply grinding them. Possessing practical

advantages appreciated by all mechanics. Circular and Price List sent free on application.

Manufactured by F. ARMSTRONG, 30 Sterling St. Bridgeport, Conn.

### BINGHAMTON HARDWARE CO.,

BINGHAMTON, NEW YORK,

WHOLESALE DEALERS IN

### LIGHT & HEAVY HARDWARE.

MOTLEY & STERLING, Proprietors.

DEALERS IN

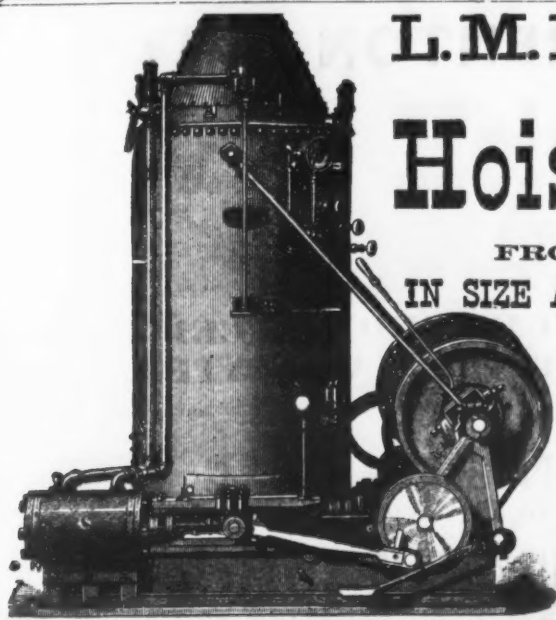
Railway, Machinists' and Contractors' Supplies.

NO. 86 JOHN ST., NEW YORK.









# L. M. RUMSEY MFG. CO.

ST. LOUIS, MO.

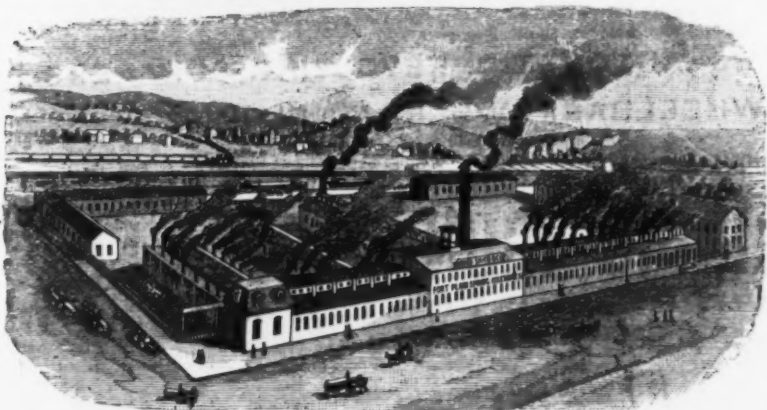
## Hoisting Engines

FROM 4 TO 50 HORSE POWER,  
IN SIZE AND STYLE TO SUIT REQUIREMENTS.

SPECIAL COAL-HOISTING ENGINES  
DOUBLE-CYLINDER MINING ENGINES,  
ENGINES AND BOILERS  
Pumping Machinery,  
MINING AND ENGINEERS' SUPPLIES.

**AMERICAN BOLT CO., Lowell, Mass.,**  
MANUFACTURERS OF  
**Bolts, Nuts, Washers, Chain Links, Car  
Bolts, Bridge Bolts, Lag Screws, &c.**

THE AMERICAN STANDARD  
**CARRIAGE AND WAGON  
SPRINGS AND AXLES.**



FORT PLAIN SPRING AND AXLE WORKS.  
**WOOD, SMITH & CO., Fort Plain, N. Y.**  
Send for Catalogue and Discounts.

**STODDARD LOCK COMPANY,**  
104 Reade Street, NEW YORK.

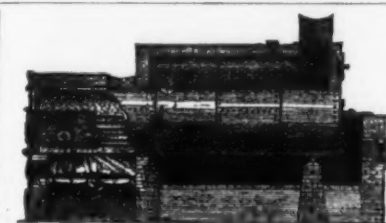


Full Size of Patent Key-hole Drawer-Pull.  
No. 25.—1 in. Applied with any of our Locks.  
**FINE FURNITURE, CABINET AND BUREAU LOCKS.**  
Our Locks are made of Brass and of Superior finish for Cabinet Work; more secure and neater when fixed than any other Lock, and cheaper applied. No screws required to fix them on. Note our Special Key-Hole Drawer-Pull that can be used to any Lock we make. The Locks are made in various sizes from 3/4 to 2 1/2 inches, measured from key-hole to face-plate. A Sample Lock mailed free for 50 cents, with Illustrated Price List.

**THE AMERICAN MACHINE CO.,**  
MANUFACTURERS OF  
**HARDWARE SPECIALTIES.**

Office and Factory: Lehigh Ave. and American St., Philadelphia. Branch House: No. 128 Chambers St., New York.  
**SPECIALTIES:** Fluting Machines, Hand Fluters, Planing Machines, Christmas Tree Holders, Bickford Portable Pump, Mrs. Potts' Patent Cold-Handle "Crown" Irons, Ice Cream Freezers and Cake Mixing Machines.

**PHILADELPHIA HYDRAULIC WORKS,**  
Washington Avenue and 21st Street,  
**STEAM PUMPS, STEAM HAMMERS,**  
STEAM ENGINES, HYDRAULIC PRESSES, BORING MILLS,  
Drill Presses, Air Compressors, Blowing Engines.

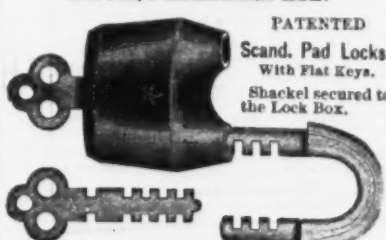


**BRIDGEPORT BOILER WORKS,**  
BRIDGEPORT, CONN.  
**LOWE & WATSON, Proprietors,**  
MANUFACTURERS OF

The Lowe Patent Tubular Boiler, with and without Superheating Drums. Fourteen years' use proves them the most durable and reliable boiler known. Gives dry steam. The process of combustion of the gases is in the construction and setting. Burns any fuel; obtains as much result from it as any boiler or setting with no more cost, and greater durability.  
Send for descriptive Circular.

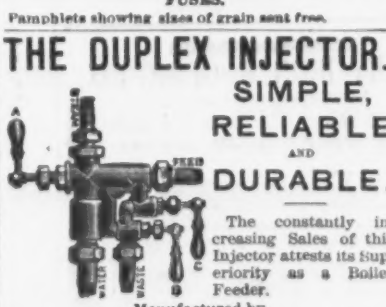
**STAR LOCK WORKS,**  
ESTABLISHED 1836.

Trunk Locks, Door Springs, Pad Locks, Trunk Stays, Dead Latches, Keys, &c., &c.  
110 South 5th St., and Sansom, bet. 5th and 6th, PHILADELPHIA.



**HILLEBRAND & WOLF.**  
**GUN POWDER.**  
**Lafin & Rand Powder Co.,**  
No. 29 Murray Street, New York.  
Manufacture and sell the following celebrated brand of sporting powder known everywhere as  
**ORANGE LIGHTNING,**  
**ORANGE DUCKING,**  
**ORANGE RIFLE**  
more popular than any powder now in use.  
Blasting Powder and Electrical Blasting Apparatus.  
Military Powder on hand and made to order.  
**SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.**  
Pamphlets showing sizes of grain sent free.

**THE DUPLEX INJECTOR.**  
SIMPLE,  
RELIABLE  
AND  
DURABLE.  
The constantly increasing sales of this Injector attests its superiority as a Boiler Feeder.  
Manufactured by  
**JAMES JENKS,**  
46, 50, 52 and 54 Randolph St.,  
DETROIT, MICH.  
**GEORGE W. BRUCE,**  
1 Platt St., New York, Proprietor of the  
**ATLANTIC SCREW WORKS,**  
Agent for the  
Florence Tack Co. and  
C. A. Maynard,  
MAYNARD'S C. & Planters' Milling, Bog and Handled Planers, Cotton and Field Hoes.  
BRUCE'S Crows, Planters' and Milling.  
ELWELL'S Weeding, Planters' and Grub, and a variety of other kinds for Home and Export Trade.



**JAMES JENKS,**  
46, 50, 52 and 54 Randolph St.,  
DETROIT, MICH.  
**GEORGE W. BRUCE,**  
1 Platt St., New York, Proprietor of the  
**ATLANTIC SCREW WORKS,**  
Agent for the  
Florence Tack Co. and  
C. A. Maynard,  
MAYNARD'S C. & Planters' Milling, Bog and Handled Planers, Cotton and Field Hoes.  
BRUCE'S Crows, Planters' and Milling.  
ELWELL'S Weeding, Planters' and Grub, and a variety of other kinds for Home and Export Trade.

# J. F. WOLLENSAK'S

PATENT



Transom  
Lifter  
and Lock.

For all kinds  
of Transoms.  
Fanlights and  
Skylights.  
Send for catalogue  
and price list.

**J. F. WOLLENSAK,**  
Patentee and Sole Manufacturer,  
**CHICAGO, ILL.**

This Band Saw has a 30-inch wheel, covered with rubber. Saws 12 inches wide. Both wheels are adjustable, the upper one by a thumb-screw by which the saw can be run anywhere on the wheel, the lower one by three screws at either end of frame. Both wheels run in boxes of the best babbit metal. The upper spindle is of steel, the lower of hammered iron. The slides are bolted on the frame, and the wear can be taken up. The upper end of screw has rubber spring, which allows the saw to give at any sudden jar, and should make 40 revolutions per minute. We send one pair Bracing Tongs, Form, two Clamps, and Silver enough for twenty welds with every Saw.  
**SNIGGS & CO., 210 Terrace, Buffalo, N. Y.**

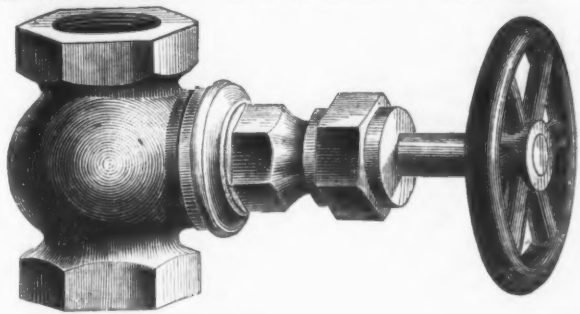
**Geo. A. Boynton**  
**BROKER IN IRON**  
70 WALL ST., N.Y.  
**BOSTON.**  
Reported by Macomber, Bigelow & Douse.

**Avril & Vile.**  
No. 1, \$5.25; No. 2, 4.75; No. 3, 5.50 each..... \$12.25  
**Angus & Bitts.**—Snell's Auger..... \$12.25  
Jennings' Bitts..... \$12.25  
Cook's Bitts..... \$12.25  
Shepardson's Double Cut Bitts..... \$12.25  
Shepardson's Double Glimets..... \$12.25  
Stearns' Extension Hollow Augers—  
No. 2, 7 ft. doz., \$2.00; No. 3, 9 ft. doz., \$2.00; No. 4, 11 ft. doz., \$2.00; No. 5, 13 ft. doz., \$2.00; No. 6, 15 ft. doz., \$2.00; No. 7, 17 ft. doz., \$2.00; No. 8, 19 ft. doz., \$2.00; No. 9, 21 ft. doz., \$2.00; No. 10, 23 ft. doz., \$2.00; No. 11, 25 ft. doz., \$2.00; No. 12, 27 ft. doz., \$2.00; No. 13, 29 ft. doz., \$2.00; No. 14, 31 ft. doz., \$2.00; No. 15, 33 ft. doz., \$2.00; No. 16, 35 ft. doz., \$2.00; No. 17, 37 ft. doz., \$2.00; No. 18, 39 ft. doz., \$2.00; No. 19, 41 ft. doz., \$2.00; No. 20, 43 ft. doz., \$2.00; No. 21, 45 ft. doz., \$2.00; No. 22, 47 ft. doz., \$2.00; No. 23, 49 ft. doz., \$2.00; No. 24, 51 ft. doz., \$2.00; No. 25, 53 ft. doz., \$2.00; No. 26, 55 ft. doz., \$2.00; No. 27, 57 ft. doz., \$2.00; No. 28, 59 ft. doz., \$2.00; No. 29, 61 ft. doz., \$2.00; No. 30, 63 ft. doz., \$2.00; No. 31, 65 ft. doz., \$2.00; No. 32, 67 ft. doz., \$2.00; No. 33, 69 ft. doz., \$2.00; No. 34, 71 ft. doz., \$2.00; No. 35, 73 ft. doz., \$2.00; No. 36, 75 ft. doz., \$2.00; No. 37, 77 ft. doz., \$2.00; No. 38, 79 ft. doz., \$2.00; No. 39, 81 ft. doz., \$2.00; No. 40, 83 ft. doz., \$2.00; No. 41, 85 ft. doz., \$2.00; No. 42, 87 ft. doz., \$2.00; No. 43, 89 ft. doz., \$2.00; No. 44, 91 ft. doz., \$2.00; No. 45, 93 ft. doz., \$2.00; No. 46, 95 ft. doz., \$2.00; No. 47, 97 ft. doz., \$2.00; No. 48, 99 ft. doz., \$2.00; No. 49, 101 ft. doz., \$2.00; No. 50, 103 ft. doz., \$2.00; No. 51, 105 ft. doz., \$2.00; No. 52, 107 ft. doz., \$2.00; No. 53, 109 ft. doz., \$2.00; No. 54, 111 ft. doz., \$2.00; No. 55, 113 ft. doz., \$2.00; No. 56, 115 ft. doz., \$2.00; No. 57, 117 ft. doz., \$2.00; No. 58, 119 ft. doz., \$2.00; No. 59, 121 ft. doz., \$2.00; No. 60, 123 ft. doz., \$2.00; No. 61, 125 ft. doz., \$2.00; No. 62, 127 ft. doz., \$2.00; No. 63, 129 ft. doz., \$2.00; No. 64, 131 ft. doz., \$2.00; No. 65, 133 ft. doz., \$2.00; No. 66, 135 ft. doz., \$2.00; No. 67, 137 ft. doz., \$2.00; No. 68, 139 ft. doz., \$2.00; No. 69, 141 ft. doz., \$2.00; No. 70, 143 ft. doz., \$2.00; No. 71, 145 ft. doz., \$2.00; No. 72, 147 ft. doz., \$2.00; No. 73, 149 ft. doz., \$2.00; No. 74, 151 ft. doz., \$2.00; No. 75, 153 ft. doz., \$2.00; No. 76, 155 ft. doz., \$2.00; No. 77, 157 ft. doz., \$2.00; No. 78, 159 ft. doz., \$2.00; No. 79, 161 ft. doz., \$2.00; No. 80, 163 ft. doz., \$2.00; No. 81, 165 ft. doz., \$2.00; No. 82, 167 ft. doz., \$2.00; No. 83, 169 ft. doz., \$2.00; No. 84, 171 ft. doz., \$2.00; No. 85, 173 ft. doz., \$2.00; No. 86, 175 ft. doz., \$2.00; No. 87, 177 ft. doz., \$2.00; No. 88, 179 ft. doz., \$2.00; No. 89, 181 ft. doz., \$2.00; No. 90, 183 ft. doz., \$2.00; No. 91, 185 ft. doz., \$2.00; No. 92, 187 ft. doz., \$2.00; No. 93, 189 ft. doz., \$2.00; No. 94, 191 ft. doz., \$2.00; No. 95, 193 ft. doz., \$2.00; No. 96, 195 ft. doz., \$2.00; No. 97, 197 ft. doz., \$2.00; No. 98, 199 ft. doz., \$2.00; No. 99, 201 ft. doz., \$2.00; No. 100, 203 ft. doz., \$2.00; No. 101, 205 ft. doz., \$2.00; No. 102, 207 ft. doz., \$2.00; No. 103, 209 ft. doz., \$2.00; No. 104, 211 ft. doz., \$2.00; No. 105, 213 ft. doz., \$2.00; No. 106, 215 ft. doz., \$2.00; No. 107, 217 ft. doz., \$2.00; No. 108, 219 ft. doz., \$2.00; No. 109, 221 ft. doz., \$2.00; No. 110, 223 ft. doz., \$2.00; No. 111, 225 ft. doz., \$2.00; No. 112, 227 ft. doz., \$2.00; No. 113, 229 ft. doz., \$2.00; No. 114, 231 ft. doz., \$2.00; No. 115, 233 ft. doz., \$2.00; No. 116, 235 ft. doz., \$2.00; No. 117, 237 ft. doz., \$2.00; No. 118, 239 ft. doz., \$2.00; No. 119, 241 ft. doz., \$2.00; No. 120, 243 ft. doz., \$2.00; No. 121, 245 ft. doz., \$2.00; No. 122, 247 ft. doz., \$2.00; No. 123, 249 ft. doz., \$2.00; No. 124, 251 ft. doz., \$2.00; No. 125, 253 ft. doz., \$2.00; No. 126, 255 ft. doz., \$2.00; No. 127, 257 ft. doz., \$2.00; No. 128, 259 ft. doz., \$2.00; No. 129, 261 ft. doz., \$2.00; No. 130, 263 ft. doz., \$2.00; No. 131, 265 ft. doz., \$2.00; No. 132, 267 ft. doz., \$2.00; No. 133, 269 ft. doz., \$2.00; No. 134, 271 ft. doz., \$2.00; No. 135, 273 ft. doz., \$2.00; No. 136, 275 ft. doz., \$2.00; No. 137, 277 ft. doz., \$2.00; No. 138, 279 ft. doz., \$2.00; No. 139, 281 ft. doz., \$2.00; No. 140, 283 ft. doz., \$2.00; No. 141, 285 ft. doz., \$2.00; No. 142, 287 ft. doz., \$2.00; No. 143, 289 ft. doz., \$2.00; No. 144, 291 ft. doz., \$2.00; No. 145, 293 ft. doz., \$2.00; No. 146, 295 ft. doz., \$2.00; No. 147, 297 ft. doz., \$2.00; No. 148, 299 ft. doz., \$2.00; No. 149, 301 ft. doz., \$2.00; No. 150, 303 ft. doz., \$2.00; No. 151, 305 ft. doz., \$2.00; No. 152, 307 ft. doz., \$2.00; No. 153, 309 ft. doz., \$2.00; No. 154, 311 ft. doz., \$2.00; No. 155, 313 ft. doz., \$2.00; No. 156, 315 ft. doz., \$2.00; No. 157, 317 ft. doz., \$2.00; No. 158, 319 ft. doz., \$2.00; No. 159, 321 ft. doz., \$2.00; No. 160, 323 ft. doz., \$2.00; No. 161, 325 ft. doz., \$2.00; No. 162, 327 ft. doz., \$2.00; No. 163, 329 ft. doz., \$2.00; No. 164, 331 ft. doz., \$2.00; No. 165, 333 ft. doz., \$2.00; No. 166, 335 ft. doz., \$2.00; No. 167, 337 ft. doz., \$2.00; No. 168, 339 ft. doz., \$2.00; No. 169, 341 ft. doz., \$2.00; No. 170, 343 ft. doz., \$2.00; No. 171, 345 ft. doz., \$2.00; No. 172, 347 ft. doz., \$2.00; No. 173, 349 ft. doz., \$2.00; No. 174, 351 ft. doz., \$2.00; No. 175, 353 ft. doz., \$2.00; No. 176, 355 ft. doz., \$2.00; No. 177, 357 ft. doz., \$2.00; No. 178, 359 ft. doz., \$2.00; No. 179, 361 ft. doz., \$2.00; No. 180, 363 ft. doz., \$2.00; No. 181, 365 ft. doz., \$2.00; No. 182, 367 ft. doz., \$2.00; No. 183, 369 ft. doz., \$2.00; No. 184, 371 ft. doz., \$2.00; No. 185, 373 ft. doz., \$2.00; No. 186, 375 ft. doz., \$2.00; No. 187, 377 ft. doz., \$2.00; No. 188, 379 ft. doz., \$2.00; No. 189, 381 ft. doz., \$2.00; No. 190, 383 ft. doz., \$2.00; No. 191, 385 ft. doz., \$2.00; No. 192, 387 ft. doz., \$2.00; No. 193, 389 ft. doz., \$2.00; No. 194, 391 ft. doz., \$2.00; No. 195, 393 ft. doz., \$2.00; No. 196, 395 ft. doz., \$2.00; No. 197, 397 ft. doz., \$2.00; No. 198, 399 ft. doz., \$2.00; No. 199, 401 ft. doz., \$2.00; No. 200, 403 ft. doz., \$2.00; No. 201, 405 ft. doz., \$2.00; No. 202, 407 ft. doz., \$2.00; No. 203, 409 ft. doz., \$2.00; No. 204, 411 ft. doz., \$2.00; No. 205, 413 ft. doz., \$2.00; No. 206, 415 ft. doz., \$2.00; No. 207, 417 ft. doz., \$2.00; No. 208, 419 ft. doz., \$2.00; No. 209, 421 ft. doz., \$2.00; No. 210, 423 ft. doz., \$2.00; No. 211, 425 ft. doz., \$2.00; No. 212, 427 ft. doz., \$2.00; No. 213, 429 ft. doz., \$2.00; No. 214, 431 ft. doz., \$2.00; No. 215, 433 ft. doz., \$2.00; No. 216, 435 ft. doz., \$2.00; No. 217, 437 ft. doz., \$2.00; No. 218, 439 ft. doz., \$2.00; No. 219, 441 ft. doz., \$2.00; No. 220, 443 ft. doz., \$2.00; No. 221, 445 ft. doz., \$2.00; No. 222, 447 ft. doz., \$2.00; No. 223, 449 ft. doz., \$2.00; No. 224, 451 ft. doz., \$2.00; No. 225, 453 ft. doz., \$2.00; No. 226, 455 ft. doz., \$2.00; No. 227, 457 ft. doz., \$2.00; No. 228, 459 ft. doz., \$2.00; No. 229, 461 ft. doz., \$2.00; No. 230, 463 ft. doz., \$2.00; No. 231, 465 ft. doz., \$2.00; No. 232, 467 ft. doz., \$2.00; No. 233, 469 ft. doz., \$2.00; No. 234, 471 ft. doz., \$2.00; No. 235, 473 ft. doz., \$2.00; No. 236, 475 ft. doz., \$2.00; No. 237, 477 ft. doz., \$2.00; No. 238, 479 ft. doz., \$2.00; No. 239, 481 ft. doz., \$2.00; No. 240, 483 ft. doz., \$2.00; No. 241, 485 ft. doz., \$2.00; No. 242, 487 ft. doz., \$2.00; No. 243, 489 ft. doz., \$2.00; No. 244, 491 ft. doz., \$2.00; No. 245, 493 ft. doz., \$2.00; No. 246, 495 ft. doz., \$2.00; No. 247, 497 ft. doz., \$2.00; No. 248, 499 ft. doz., \$2.00; No. 249, 501 ft. doz., \$2.00; No. 250, 503 ft. doz., \$2.00; No. 251, 505 ft. doz., \$2.00; No. 252, 507 ft. doz., \$2.00; No. 253, 509 ft. doz., \$2.00; No. 254, 511 ft. doz., \$2.00; No. 255, 513 ft. doz., \$2.00; No. 256, 515 ft. doz., \$2.00; No. 257, 517 ft. doz., \$2.00; No. 258, 519 ft. doz., \$2.00; No. 259, 521 ft. doz., \$2.00; No. 260, 523 ft. doz., \$2.00; No. 261, 525 ft. doz., \$2.00; No. 262, 527 ft. doz., \$2.00; No. 263, 529 ft. doz., \$2.00; No. 264, 531 ft. doz., \$2.00; No. 265, 533 ft. doz., \$2.00; No. 266, 535 ft. doz., \$2.00; No. 267, 537 ft. doz., \$2.00; No. 268, 539 ft. doz., \$2.00; No. 269, 541 ft. doz., \$2.00; No. 270, 543 ft. doz., \$2.00; No. 271, 545 ft. doz., \$2.00; No. 272, 547 ft. doz., \$2.00; No. 273, 549 ft. doz., \$2.00; No. 274, 551 ft. doz., \$2.00; No. 275, 553 ft. doz., \$2.00; No. 276, 555 ft. doz., \$2.00; No. 277, 557 ft. doz., \$2.00; No. 278, 559 ft. doz., \$2.00; No. 279, 561 ft. doz., \$2.00; No. 280, 563 ft. doz., \$2.00; No. 281, 565 ft. doz., \$2.00; No. 282, 567 ft. doz., \$2.00; No. 283, 569 ft. doz., \$2.00; No. 284, 571 ft. doz., \$2.00; No. 285, 573 ft. doz., \$2.00; No. 286, 575 ft. doz., \$2.00; No. 287, 577 ft. doz., \$2.00; No. 288, 579 ft. doz., \$2.00; No. 289, 581 ft. doz., \$2.00; No. 290, 583 ft. doz., \$2.00; No. 291, 585 ft. doz., \$2.00; No. 292, 587 ft. doz., \$2.00; No. 293, 589 ft. doz., \$2.00; No. 294, 591 ft. doz., \$2.00; No. 295, 593 ft. doz., \$2.00; No. 296, 595 ft. doz., \$2.00; No. 297, 597 ft. doz., \$2.00; No. 298, 599 ft. doz., \$2.00; No. 299, 601 ft. doz., \$2.00; No. 300, 603 ft. doz., \$2.00; No. 301, 605 ft. doz., \$2.00; No. 302, 607 ft. doz., \$2.00; No. 303, 609 ft. doz., \$2.00; No. 304, 611 ft. doz., \$2.00; No. 305, 613 ft. doz., \$2.00; No. 306, 615 ft. doz., \$2.00; No. 307, 617 ft. doz., \$2.00; No. 308, 619 ft. doz., \$2.00; No. 309, 621 ft. doz., \$2.00; No. 310, 623 ft. doz., \$2.00; No. 311, 625 ft. doz., \$2.00; No. 312, 627 ft. doz., \$2.00; No. 313, 629 ft. doz., \$2.00; No. 314, 631 ft. doz., \$2.00; No. 315, 633 ft. doz., \$2.00; No. 316, 635 ft. doz., \$2.00; No. 317, 637 ft. doz., \$2.00; No. 318, 639 ft. doz., \$2.00; No. 319, 641 ft. doz., \$2.00; No. 320, 643 ft. doz., \$2.00; No. 321, 645 ft. doz., \$2.00; No. 322, 647 ft. doz., \$2.00; No. 323, 649 ft. doz., \$2.00; No. 324, 651 ft. doz., \$2.00; No. 325, 653 ft. doz., \$2.00; No. 326, 655 ft. doz., \$2.00; No. 327, 657 ft. doz., \$2.00; No. 328, 659 ft. doz., \$2.00; No. 329, 661 ft. doz., \$2.00; No. 330, 663 ft. doz., \$2.00; No. 331, 665 ft. doz., \$2.00; No. 332, 667 ft. doz., \$2.00; No. 333, 669 ft. doz., \$2.00; No. 334, 671 ft. doz., \$2.00; No. 335, 673 ft. doz., \$2.00; No. 336, 675 ft. doz., \$2.00; No. 337, 677 ft. doz., \$2.00; No. 338, 679 ft. doz., \$2.00; No. 339, 681 ft. doz., \$2.00; No. 340, 683 ft. doz., \$2.00; No. 341, 685 ft. doz., \$2.00; No. 342, 687 ft. doz., \$2.00; No. 343, 689 ft. doz., \$2.00; No. 344, 691 ft. doz., \$2.00; No. 345, 693 ft. doz., \$2.00; No. 346, 695 ft. doz., \$2.00; No. 347, 697 ft. doz., \$2.00; No. 348, 699 ft. doz., \$2.00; No. 349, 701 ft. doz., \$2.00; No. 350, 703 ft. doz., \$2.00; No. 351, 705 ft. doz., \$2.00; No. 352, 707 ft. doz., \$2.00; No. 353, 709 ft. doz., \$2.00; No. 354, 711 ft. doz., \$2.00; No. 355, 713 ft. doz., \$2.00; No. 356, 715 ft. doz., \$2.00; No. 357, 717 ft. doz., \$2.00; No. 358, 719 ft. doz., \$2.00; No. 359, 721 ft. doz., \$2.00; No. 360, 723 ft. doz., \$2.00; No. 361, 725 ft. doz., \$2.00; No. 362, 727 ft. doz., \$2.00; No. 363, 729 ft. doz., \$2.00; No. 364, 731 ft. doz., \$2.00; No. 365, 733 ft. doz., \$2.00; No. 366, 735 ft. doz., \$2.00; No. 367, 737 ft. doz., \$2.00; No. 368, 739 ft. doz., \$2.00; No. 369, 741 ft. doz., \$2.00; No. 370, 743 ft. doz., \$2.00; No. 371, 745 ft. doz., \$2.00; No. 372, 747 ft. doz., \$2.00; No. 373, 749 ft. doz., \$2.00; No. 374, 751 ft. doz., \$2.00; No. 375, 753 ft. doz., \$2.00; No. 376, 755 ft. doz., \$2.00; No. 377, 757 ft. doz., \$2.00; No. 378, 759 ft. doz., \$2.00; No. 379, 761 ft. doz., \$2.00; No. 380, 763 ft. doz., \$2.00; No. 381, 765 ft. doz., \$2.00; No. 382, 767 ft. doz., \$2.00; No. 383, 769 ft. doz., \$2.00; No. 384, 771 ft. doz., \$2.00; No. 385, 773 ft. doz., \$2.00; No. 386, 775 ft. doz., \$2.00; No. 387, 777 ft. doz., \$2.00; No. 388, 779 ft. doz., \$2.00; No. 389, 781 ft. doz., \$2.00; No. 390, 783 ft. doz., \$2.00; No. 391, 785 ft. doz., \$2.00; No. 392, 787 ft. doz., \$2.00; No. 393, 789 ft. doz., \$2.00; No. 394, 791 ft. doz., \$2.00; No. 395, 793 ft. doz., \$2.00; No. 396, 795 ft. doz., \$2.00; No. 397, 797 ft. doz., \$2.00; No. 398, 799 ft. doz., \$2.00; No. 399, 801 ft. doz., \$2.00; No. 400, 803 ft. doz., \$2.00; No. 401, 805 ft. doz., \$2.00; No. 402, 807 ft. doz., \$2.00; No. 403, 809 ft. doz., \$2.00; No. 404, 811 ft. doz., \$2.00; No. 405, 813 ft. doz., \$2.00; No. 406, 815 ft. doz., \$2.00; No. 407, 817 ft. doz., \$2.00; No. 408, 819 ft. doz., \$2.00; No. 409, 821 ft. doz., \$2.00; No. 410, 823 ft. doz., \$2.00; No. 411, 825 ft. doz., \$2.00; No. 412, 827 ft. doz., \$2.00; No. 413, 829 ft. doz., \$2.00; No. 414, 831 ft. doz., \$2.00; No. 415, 833 ft. doz., \$2.00; No. 416, 835 ft. doz., \$2.00; No. 417, 837 ft. doz., \$2.00; No. 418, 839 ft. doz., \$2.00; No. 419, 841 ft. doz., \$2.00; No. 420, 843 ft. doz., \$2.00; No. 421, 845 ft. doz., \$2.00; No. 422, 847 ft. doz., \$2.00; No. 423, 849 ft. doz., \$2.00; No. 424, 851 ft. doz., \$2.00; No. 425, 853 ft. doz., \$2.00; No. 426, 855 ft. doz., \$2.00; No. 427, 857 ft. doz., \$2.00; No. 428, 859 ft. doz., \$2.00; No. 429, 861 ft. doz., \$2.00; No. 430, 863 ft. doz., \$2.00; No. 431, 865 ft. doz., \$2.00; No. 432, 867 ft. doz., \$2.00; No. 433, 869 ft. doz., \$2.00; No. 434, 871 ft. doz., \$2.00; No. 435, 873 ft. doz., \$2.00; No. 436, 875 ft. doz



**McNab & Harlin Mfg. Co.,**

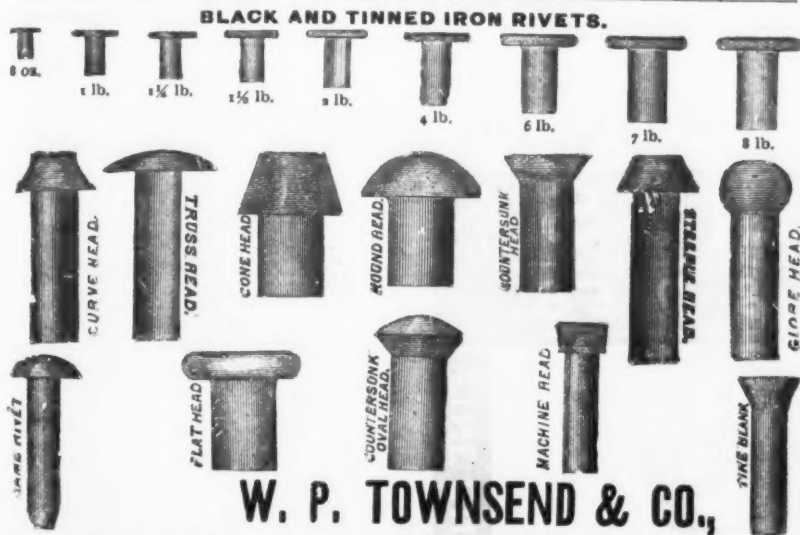
MANUFACTURERS OF

**BRASS COCKS AND VALVES,**

For STEAM,  
WATER,  
and GAS.  
Wrought Iron  
Pipe  
and Fittings,  
**PLUMBERS'  
MATERIALS,**

Factory, Paterson, N. J.

56 John Street, N. Y.

**W. P. TOWNSEND & CO.,**

PITTSBURGH, PA.,

Manufacturers of every description of First Quality

**H. B. NEWHALL CO.,**  
105 Chambers St.,  
New York Agents.

**RIVETS.**

Wm. H. HASKELL, Pres.

E. S. MASON, Treas.

**WM. H. HASKELL CO.,**  
Pawtucket, R. I.

MANUFACTURERS OF

**COACH SCREWS,**

(With Gimlet Points.)

ALL KINDS OF



Machine and Plow Bolts,

TAP BOLTS.

**H. B. NEWHALL CO.,**  
105 Chambers St.,  
New York Agents.

**STANDARD NUT CO.,**

Pittsburgh, Pa.,

MANUFACTURERS OF

**HOT PRESSED**

Square &amp; Hexagon Nuts,

**R. R. FISH BARS,****BOLTS,****SPIKES.****RIVETS, &c.**

**H. B. NEWHALL CO.,**  
105 Chambers St.,  
New York Agents.

**Philadelphia "STAR" Bolt Works.**

NORWAY IRON

FANCY HEAD BOLTS,

Carriage & Tire Bolts. **Star Axle Clips, &c**

TOWNSEND, WILSON &amp; HUBBARD, 2301 Cherry Street, Philadelphia, Pa

**BAGNALL & LOUD,**

BOSTON, MASS.

Sole Manufacturers in U. S. A. of our Celebrated

**METALINE**

AND

Improved Sleeve Roller  
Bush Tackle Blocks.

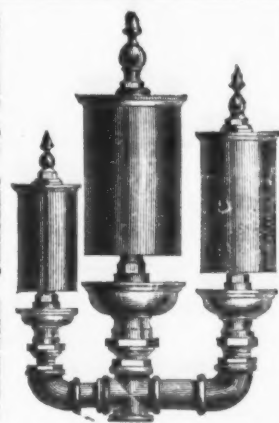
Try Us with a Sample Order.

Send for Illustrated Catalogue.

New York Warehouse, 33 South Street.



WHISTLE CHIMES TO ORDER.

**EATON, COLE & BURNHAM CO.,**58 John St.,  
NEW YORK.Factory at  
BRIDGEPORT, CT.

MANUFACTURERS OF

**Fittings, Valves, Tools,**

AND ALL STYLES OF

Goods for Steam, Water, and  
Gas, Wrought Iron Pipe, &c.Agents for **BUNDY'S RADIATORS.**

Manufacturers of

DEANE'S PATENT SOLID STOCKS AND DIES.

**LIGHTNING HAY KNIVES.**

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow  
and stack, cutting fine feed from bale, cutting corn stalks for feed, cut-  
ting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is  
giving universal satisfaction. A few moments' trial will show its merits,  
and parties once using it are unwilling to do without it. Its sales are  
fast increasing for exports as well as home trade, and it seems destined  
to take the place of all other Hay Knives.

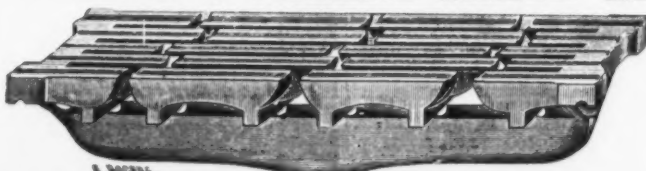
They are nicely packed in boxes, one dozen each, of 50 pounds weight,  
suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

**HIRAM HOLT & CO.,**

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

**W. C. WREN'S PATENT GRATE BAR.****DAVID S. CRESWELL, Manufacturer,**

816 Race Street,

PHILADELPHIA, PA.

The most durable Grate Bar on the market.

Send for circular and price list

**Ludlow Valve Mfg. Co.**

OFFICE AND WORKS:

938 to 954 River St. &amp; 67 to 83 Vail Ave., Troy, N. Y.

**VALVES.**Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.,  
for Gas, Water and Steam. Send for Circular.**Also FIRE HYDRANTS.****ROOF CRESTING AND FINIALS,**

Weather Vanes, Tower Ornaments, &amp;c.

**WROUGHT IRON FENCES,**

Iron Shutters, Window Guards, Jail Work, &amp;c.,

**BANK AND OFFICE RAILINGS,**

WIRE and IRON WORK of Every Description.

**THE E. T. BARNUM WIRE & IRON WORKS,**

Detroit, Mich., U. S. A.

INCORPORATED MAY, 1882.

**PAWTUCKET MFG. CO.,**

MANUFACTURERS OF

**BOLTS, COLD PUNCHED NUTS  
AND WASHERS,**

Iron and Steel Set Screws, Cap Screws, Forged or Milled

CHAIN LINKS, STIRRUPS, LEVERS, &amp;c.

ALL KINDS OF COLD PUNCHING.

Webb's Revolving Forge Furnaces.

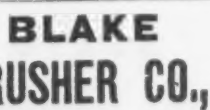
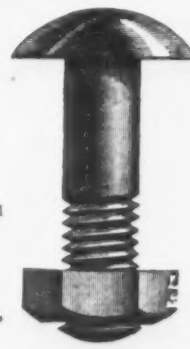
PAWTUCKET,

R. I.

STEWART A. JENK, PRES.

GEO. H. WEBB, AGENT.

GEO. H. FOWLER, TREAS.

**BLAKE  
CRUSHER CO.,**

New Haven Conn.

**BLAKE'S  
Challenge Rock Breakers.**

Patented Nov. 18, 1879.

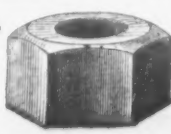
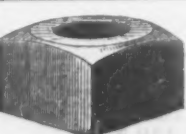
See The Iron Age first issue of the  
month.**NEW HAVEN NUT CO.**

MANUFACTURERS OF

**HOT-PRESSED NUTS AND WASHERS,**

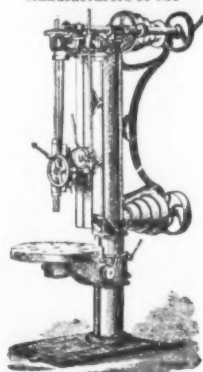
See Iron Age First Issue Each Month.

WESTVILLE, CONN.

**P. BLAISDELL & CO.,**

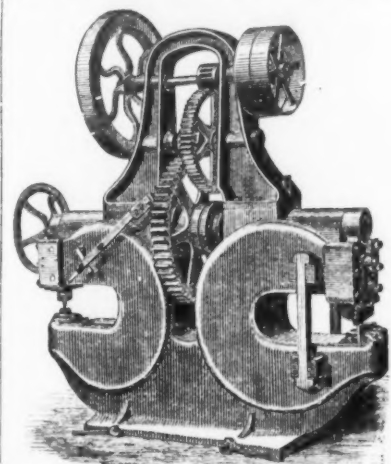
WORCESTER, MASS.

Manufacturers of the

**"BLAISDELL" UPRIGHT DRILLS**

And other First-Class Machinists' Tools.

COMBINED

**PUNCH & SHEARS.**

Lambertville Iron Works,

**A. WELCH,**

LAMBERTVILLE, N. J.

**Holt's Forges.**

FIVE SIZES.

FOR ALL KINDS OF WORK.

\$10 and Upward.

Send for circulars.

**HOLT MFG. CO.,**

Cleveland, Ohio.

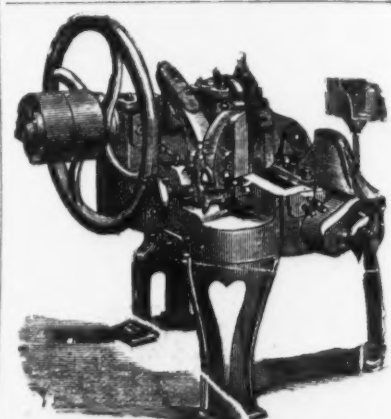
**WILLIAMS, WHITE & CO.,**

MOLINE, ILLINOIS.

**DROPHAMMERS,**HORIZONTAL PRESSES FOR BENDING IRON,  
GANG BORING MACHINES, TOOLS FOR PLOW MAKERS.

THE JUSTICE HAMMER.

SEND FOR CIRCULARS.

**PITTSBURGH MFG. CO.,**Manufacturers of Nail and Spike Machines, Bolts,  
Nuts, Washers, Rivets, &c. Castings, Forgings  
and Blacksmith Work promptly attended to.

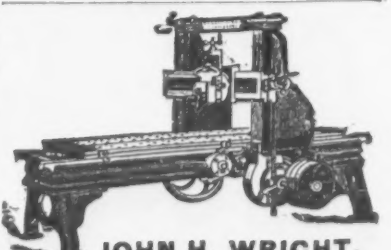
OFFICE &amp; WORKS, Railroad St. near 28th, Pittsburgh, Pa.

**THE LA FRANCE FIRE ENGINE CO**

Manufacturers of

**Rotary Steam Fire Engines**

ELMIRA, N. Y.

**JOHN H. WRIGHT,**

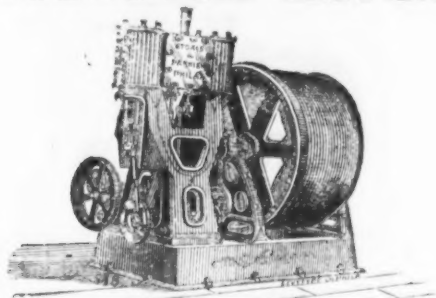
Manufacturer of Machinists' Tools

From the late Wood, Light & Co.'s Patterns  
of Lathes and Planers.

Look Box 1856, Bridgeport,



## VERTICAL ENGINE



## IRON FURNACE HOIST.

The above cut represents our Vertical Iron Furnace Hoisting Engine, having double cylinders fitted with our improved reverb ing valves, automatic stop and brake.  
Prices furnished on application for engine alone or for complete outfit.  
Patterns on hand for various sizes.

STOKES & PARRISH, 3001 Chestnut St., Philadelphia

\$\$\$ \$ SAVED \$\$\$

1977 NINETEEN HUNDRED SEVENTY-SEVEN 1977

## MACHINES

BOTH NEW AND SECOND-HAND

COMPRISING  
MACHINE AND BLACKSMITH  
TOOLS OF EVERY DESCRIPTION.  
WOOD-WORKING MACHINERY IN ALL ITS  
BRANCHES, PORTABLE ENGINES, UPRIGHT and HOR-  
IZONTAL STATIONARY ENGINES, 1 TO  
30 HORSE POWER. S.C.F. & CO. LOCOMOTIVE FIRE-  
BOX, HORIZONTAL, and UPRIGHT BOIL-  
ERS, 1 TO 100 HORSE POWER. WATER WHEELS, COT-  
TON AND WOOLLEN MACHINERY, STEAM  
PUMPS, CRISTMILL MACHINERY,  
Etc., FULLY DESCRIBED, AND  
PRICES ANNEXED.

Send stamp for sam.

In our List No. 23.

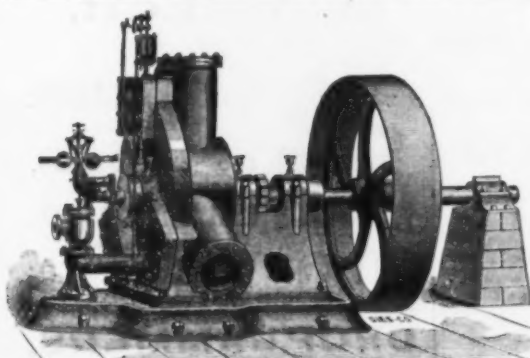
[stating what you want.]

We have the Largest Assortment of Machinery to be found in the hands of any firm in the country.

Works and Main Office,  
Manchester, N. H.

S. C. FORSAITH & CO.

Branch Office and Wareroom, 205 Centre street, New York City.

GARDNER'S  
PATENT  
Three Cylinder  
ENGINE.

The Most Simple and  
DURABLE  
Steam Engine in Use.  
Adapted for any duty.  
Send for Illustrated  
CATALOGUE  
Giving full description.

EVERY ENGINE WARRANTED.

OVER 5000 H. P. IN USE. Correspondence invited. Special Engine for HIGH SPEEDS, prices of which will be quoted upon application. MANUFACTURED

EXCLUSIVELY

BY R. DUNBAR & SON, Buffalo, New York, U. S. A.

209 & 211 College St. BURLINGTON, VY.

**PORTER MANUFACTURING COMPANY.**

MANUF'RS OF.

PORTER'S PATENT WINDOW & DOOR SCREEN CORNERS ETC.

EVERY ONE HIS OWN WINDOW & DOOR SCREEN MAKER.  
NO MORTISING OR TENONING, CANNOT SAG OR WARP,  
AND ANYONE CAN MAKE THEM. SEND FOR PRICE LIST.

NEW YORK, N.Y. GRAHAM & HAINES. 113 CHAMBERS ST.  
CHICAGO, ILL. W. PICKETT & SON. 164 LAKE ST.

## DROP FORGINGS

Of Every Description a Specialty.

ADDRESS,

R. H. BROWN & CO.,  
WESTVILLE, CONN.

Also Manufacturers of

W. A. CLARK'S PATENT EXPANSIVE BIT,

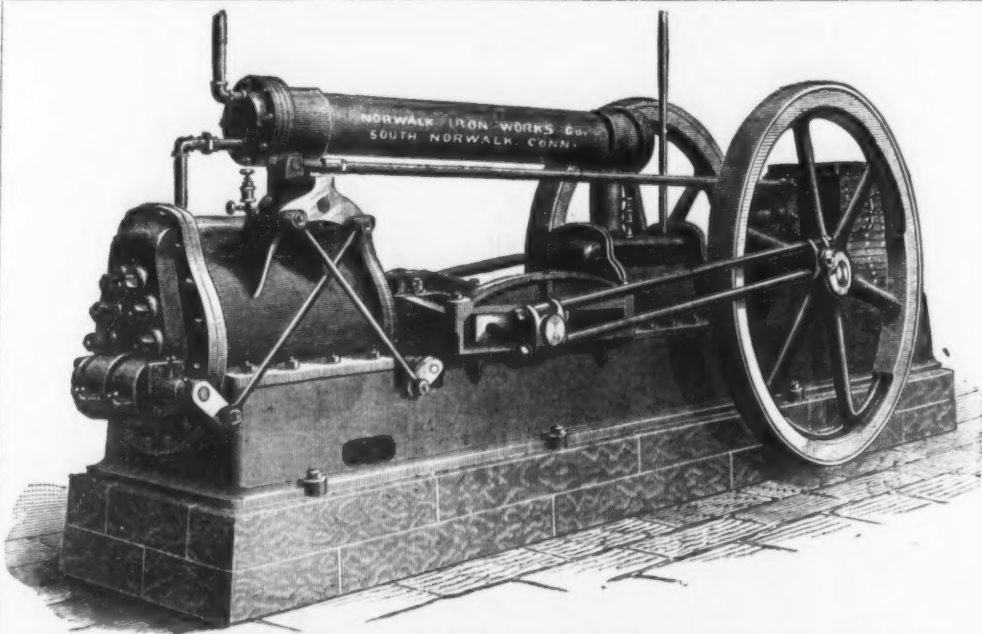
CLARK'S PATENT HANDLE SCREW DRIVER,

And Other Specialties in Hardware Line.

## THORNE, DeHAVEN &amp; CO., Drilling Machines,

21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.  
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.  
VERTICAL DRILLS. Self-feed.  
MULTIPLE DRILLS. 2 to 10 spindles.  
HORIZONTAL BORING AND DRILLING MACHINES.  
HAND DRILLS. CAR BOX DRILLS.  
SPECIAL DRILLS. For Special Work.

AIR  
COMPRESSORS.

THE NORWALK IRON WORKS CO., South Norwalk, Conn.

E.W. BLISS  
PRESSES & DIES.

SHAPERS & SQUARING SHEARS

No. 20.  
ADJUSTABLE  
POWER PRESS  
UPRIGHT POSITION



FINE ENGINE LATHES.

## SPECIAL MACHINERY FOR TIN &amp; SHEET

METAL WORKERS

PLYMOUTH, PEARL & JOHN ST'S. BROOKLYN, N.Y.

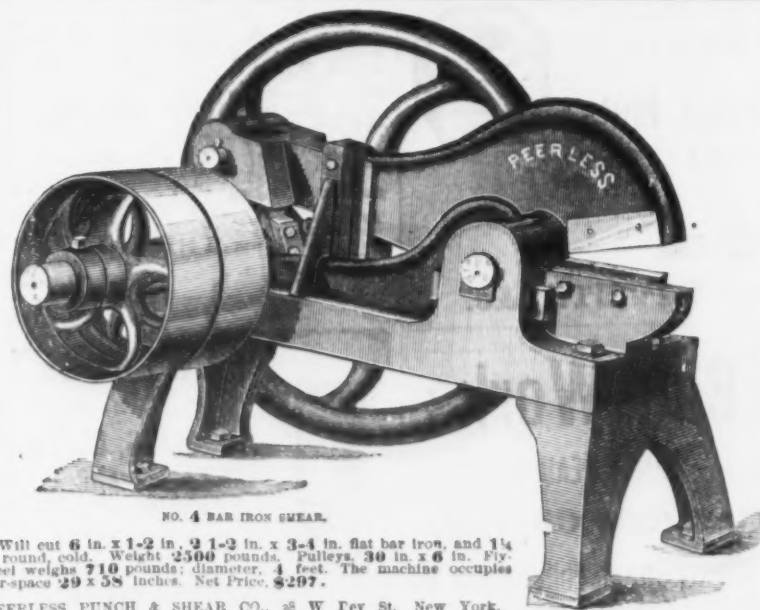
## MANNING, MAXWELL &amp; MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S



111 Liberty Street,

NEW YORK.



NO. 4 BAR IRON SHEAR.

Will cut 6 in. x 1-2 in. 2 1-2 in. x 3-4 in. flat bar iron, and 1 1/4 in. round, cold. Weight 2500 pounds. Pulls 30 in. x 6 in. Fly-wheel weighs 710 pounds; diameter, 4 feet. The machine occupies floor-space 29 x 58 inches. Net Price, \$297.

PEERLESS PUNCH & SHEAR CO., 38 W. 1st St. New York.

## The Farrel Foundry and Machine Co.

ANSONIA, CONN.,

Manufacture Improved

ROCK & ORE

BREAKERS,

(THE "BLAKE" STYLE)

designed for breaking to small

pieces and one-third dust all kinds

of hard and brittle substances, such

as Quartz, Emery, Gold and

silver Ores, Coal, Plaster,

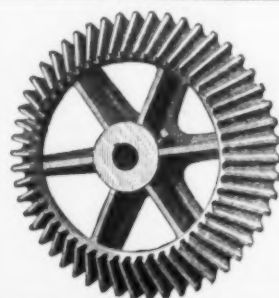
Iron, Copper and Lead Ores;

also Stone for making Concrete

and Railroad Ballast.

Twenty years of practical test, at Home and Abroad, has proven this machine to be the best one ever invented for the purpose. Mr. E. L. MANNING, for the past fifteen years connected with the manufacture of these machines, has charge of this department of our works, and will personally superintend their erection within a reasonable circuit. Gold Medal awarded at the Massachusetts Mechanics Association, 1884, and Silver Medal (special) at American Institute, New York, 1884.

COPELAND & BACON.



Machine Moulded Mill

## GEARING,

SHAFTING, PULLEYS, &c.,

in great variety of sizes. Castings or Finished

Work furnished the Trade at favorable rates.

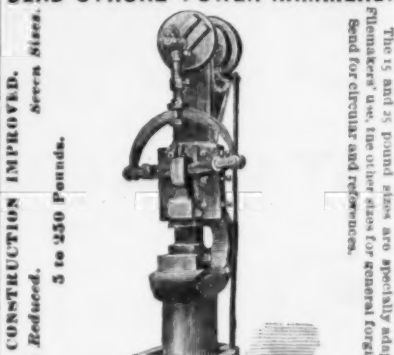
POOLE & HUNT,

BALTIMORE, MD.

RIVAL  
STEAM PUMPS  
IS  
THE  
CHEAPEST  
AND THE  
BEST  
FOR  
HOT & COLD  
WATER  
\$35.00  
UPWARDS.

MANUFACTURED BY  
JOHN H. MCGOWAN & CO.  
CINCINNATI

## DEAD-STROKE POWER HAMMERS.



CONSTRUCTION IMPROVED.  
Prices Reduced.  
Seven Sizes.  
5 to 250 Pounds.

DIENELT & EISENHARDT,

MAKERS.

1310 Howard St., Philadelphia.

DEAN BROS'  
STEAM PUMP WORKS,  
INDIANAPOLIS, IND.

Boiler Feeders, Fire Pumps,  
Pumping Machinery  
for all purposes.  
Send for  
Catalogue.



Standard Weight Lap Welded

WROUGHT IRON PIPE, &c.,

STEAM PUMPS, &c.,

STEAM AND HYDRAULIC

Freight & Passenger Elevators, &c.

STEAM HOISTING ENGINES, &c.

MANUFACTURED BY

CRANE BROS. MFG. CO.,

CHICAGO.

See Catalogue.



Machinery, &c.

LYON'S HAND OR POWER PUNCHES AND SHEARS.

For Round, Flat or Square Iron,

Polishing & Buffing Machinery,  
HYDRAULIC JACKS,  
To raise from 3 to 120 tons.  
HYDRAULIC PRESSES,  
For special and general use.

HYDRAULIC HAND & POWER PUMPS  
with 1 to 5 plungers, to run hydraulic presses, with  
either uniform or changeable speed.

Second-hand Presses.  
**E. LYON & CO.,**  
170 B Grand Street, NEW YORK  
Send for circular of what you want.

THE MACKENZIE PATENT  
CUPOLA & BLOWER.

Send for circular to  
**Smith & Sayre Mfg. Co.,**  
PROPRIETORS, 245 Broadway, New York.

This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous tuyere, or in other words, the blast enters the fuel at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace with the least resistance and enables a possible amount of power, and in combination with the continuous tuyere causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a better quality of casting, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers indicating the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 15, or 20 tons. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.

NEW OTTO SILENT GAS ENGINE.

Working Without Boiler, Steam,  
Coal, Ashes or Attendance.

Started Instantly by a Match, it gives Full  
Power Immediately.

When Stopped, all Expense Ceases.  
No explosion, no fire nor cinders, no gauges, no pumps, no engineer or other attendant while running. Recommended by insurance companies.  
UNSURPASSED IN EVERY RESPECT for hoisting in warehouses, printing ventilating, running small shops, &c.  
4, 4 and 7 H. P. and upwards. Built by  
**SCHLEICHER, SCHUMM & CO.,**  
Engineers and Machinists,  
N. E. Cor. 33d & Walnut Sts., Philadelphia.

STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE.  
SEND FOR CIRCULARS. **CLEM & MORSE,** LATEST PATENTED IMPROVEMENTS.  
Manufacturers and Builders of

**ELEVATORS,**  
Hoisting Machinery, Automatic Hatch Doors, &c.

413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., NEW YORK.

HOISTING ENGINES.

We are now prepared to deliver 6x12 and 7x12 single cylindered Horizontal Engines, and double cylindered at short notice, with the *Friskie Friction Clutch* attached, with or without boilers. This clutch has proved to be the best in the world for this work. It can be so adjusted that it will do a small amount of work, and from that up to the full power of engine, with no risk of breaking ropes, gearing or engine, a feature which no other friction contains. Address:  
**D. FRISBIE & CO., 481 N. Fifth St., Phila., Pa.**

DRILL PRESSES

New Upright Power Drill Presses. No. 3 swings 21 inches; back geared, quick return. A strong iron brace extends from base to head of column—a new feature. Weight 110 lbs.; height, 6 feet. Price, \$210.  
No. 14, on legs, swings 13 1/2 inches, 4 speeds. Price, \$85.  
No. 1 size, to set on bench, swings 13 inches, lever feed, 3 speeds, light and loose pulleys. Price, \$35.  
Peerless Punch & Shear Co.,  
38 W. Day Street, New York.

PUNCHING & SHEARING PRESSES.

Power, Foot or Hand PUNCHES, AND SHEARS.  
All sizes, from \$25 to \$3000  
**Peerless Punch & Shear Co.,**  
38 W. Day Street, NEW YORK CITY.

**E. E. GARVIN & CO.,**  
Manufacturers of

Milling Machines, Drill Presses, Hand Lathes, Tapping Machines, Cutter Grinders and Wood Planers, Milling Cutters, all shapes and sizes. Gear Cutting and Milling in all its branches.

139-143 CENTRE STREET, CORNELL'S BUILDING, NEW YORK.  
Send for Illustrated Catalogue.

**Box's Patent Portable Double Screw Hoists, &c., &c.**

FIRST PREMIUMS WHEREVER EXHIBITED.  
Philadelphia, Pa., 1879. St. Louis, Mo., 1883.  
Cincinnati, O., 1880. Philadelphia, Pa., 1880.

**Box's New Patent Portable Right and Left Screw Hoist.**

The latest invented Hoist, with all Box's Patent improvements added. Guaranteed in every particular Positive in action, and double the power of other Hoists. No thruster, no friction. Simple strong lift chain, and perfect guides for both hand and left chains. It cannot be beat. Sizes from 1000 to 25,000 pounds capacity. BOX'S PATENT PORTABLE DOUBLE SCREW HOIST. Always reliable. Sizes 10,000 and 20,000 pounds capacity. BOX'S PATENT PORTABLE DOUBLE SCREW HOIST. Simple, Durable, Cheap, Light. Sizes 500 and 1000 pounds capacity.

BOX'S PATENT POWER OR HAND ELEVATORS.  
Sizes 1000 to 25,000 pounds capacity.  
BOX'S PATENT RADIAL DRILLS, &c. Full descriptive circulars furnished.

Northern Liberties Works.  
**ALFRED BOX & CO.,**  
312 & 314 Green Street, Philadelphia, Pa.

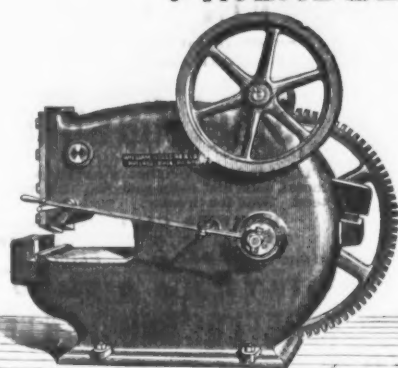
HUGONIN SASH BALANCES.  
3 sizes, made with 88 improvements. Genuine Hugonin Balances have my name cast upon them as "Patentee and Sole Authorized Maker," and dates of patents on the boxes containing same. Buy no others. Send orders direct to factory for factory prices. Address:  
**Robt. B. Hugonin,**  
Hartford, Conn., U. S. A.

**KATZENSTEIN'S** Self-Acting Metal Packing.  
For Pumps, Rods, Valves, Stems, &c.,  
Of every description.  
For Steam Engines, Locomotives, Pumps, &c., &c.  
Adopted and in use by the principal Iron Works and Steamship Companies within the last eight years in this and Foreign countries. For full particulars and references send free

**L. KATZENSTEIN & CO.,**  
109 Christopher St., near West St., N. Y.

Machinery, &c.

**WILLIAM SELLERS & CO.,**  
PHILADELPHIA.



Shearing Machine.

BRANCH OFFICE, 79 Liberty Street, New York.

**SOUTHWARK FOUNDRY & MACHINE CO.,**

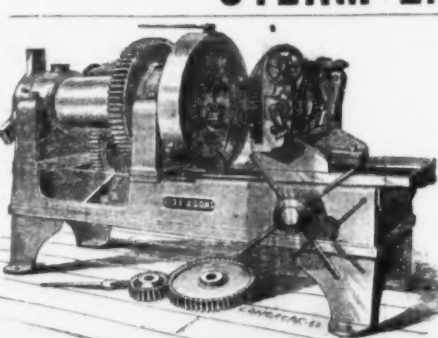
430 Washington Ave., PHILA., PA.,

ENGINEERS AND MACHINISTS.

BLOWING ENGINES AND  
HYDRAULIC MACHINERY.

SOLE MAKERS OF THE

**PORTER-ALLEN AUTOMATIC CUT-OFF STEAM ENGINE.**



Machines for Threading and Cutting off Pipe from one-eighth inch to twelve inches diameter. Hand Screwing Machines one-eighth inch to two inches.

**COX & SONS,**  
204 N. 4th St.,  
PHILADELPHIA, PA.

**WICKERSHAM & CO.,**  
MANUFACTURERS OF  
RAILWAY, MINERS', MILL & MACHINISTS' SUPPLIES.

W. & Co.'s Packing: Steam, Hydraulic and Locomotive. Samples sent free.  
Lubricants for Engines, Shafting, &c.; Rolling Mill, Railroad, Gear and Axle Grease.  
Also, Star Cylinder Oil.  
No. 309 Race Street, Philadelphia, Pa.  
No. 232 LAKE STREET, Chicago, Ill.

**HARRISON BOILER.**

BOILER MADE

OF SPHERES

MUST UNITE GREATEST



"THE SAFEST"

STRENGTH

WITH MOST

HEATING SURFACE.

Send for

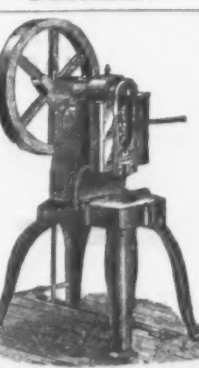
CIRCULAR.

AGENTS **RIEHLÉ BROS.**

WANTED.

Send for Prices and Discounts.

**STANDARD SCALES AND TESTING MACHINES**

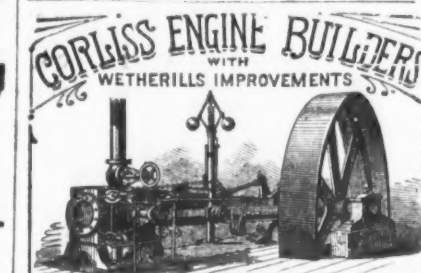


**A. H. MERRIMAN,**  
Meriden, Conn.,  
Manufacturer of all Descriptions of PRESSES.  
Catalogue and prices sent on application.

WE CHALLENGE THE WORLD FOR ITS EQUAL.  
The cheapest, most durable and effective Tool for Cleaning Tubes Hot or Cold.  
**RUFFNER & DUNN,** Schuylkill Falls, Philadelphia, Pa.,  
Patentees and Sole Manufacturers of the EXCELSIOR STEEL TUBE CLEANERS. Most liberal discount to dealers. Send for Circulars.

**THE CRESCENT STEEL TUBE SCRAPER.**  
FINEST TOOL MADE.  
SEND FOR ILLUSTRATED PRICE LIST.  
**CRESCENT MFG. CO.-CLEVELAND O. U. S. A.**

Machinery, &c.



**CORLISS ENGINE BUILDERS**  
WETHERILL'S IMPROVEMENTS  
ENGINEERS, MACHINISTS, IRON FOUNDERS  
AND BOILER MAKERS.  
**ROBT. WETHERILL & CO.** Chester, Pa.

**STOW FLEXIBLE SHAFT CO., Limited**

15th & Pennsylvania Ave. PHILADELPHIA, PA.  
Manufacturers of  
Portable Drilling, Tapping, Reaming and Boring Machines.  
Also, Tools for Emery Wheel Grinding, Metal & Wood Polishing, Cattle Brushing & Clipping, &c.  
General European Agents  
**DOLLING & LOWE,** Law  
rence Foundry Hill, London, England.

**CHARLES W. ERVIEN & CO.,**  
Engine Builders, Boiler  
Makers and  
GENERAL MACHINISTS,  
IRELAND STREET, PHILADELPHIA.

Established 1867.  
**Edwin Harrington & Son,**  
MANUFACTURERS OF  
PATENT EXTENSION AN  
SCREW CUTTING  
LATHES.  
Iron Planers,  
Radial, Upright, Suspension  
Multiple and Lever  
DRILLS,  
and a variety of other  
MACHINISTS' TOOLS  
Patent  
Double Chain Screw  
Pulley Blocks,  
Unrivalled for Durability, Safety  
and Power.  
Patent Double Chain  
Quick-Lift Hoists,  
with Brake for quick and e-  
lowering.  
Circulars furnished.  
WORKS AND OFFICE,  
Cor. N. 15th and Penna. Ave.  
Philadelphia, Pa., U. S. A.  
Represented by J. Q. MAY-  
NARD, 57 Liberty Street, N. Y.,  
C. E. WIMBOLD, 141 High St.,  
Boston, W. H. RUCKEY, 115 3rd  
St., Cincinnati.

**PHILA. SHAFTING WORKS.**

**GEO. V. CRESSON,**  
18th & Hamilton Sts.  
PHILADELPHIA.  
SHAFTING  
A SPECIALTY  
Manufacturers of  
Shafting, Pulleys,  
Hangers, Couplings  
and every appurte-  
nance used in the  
TRANSMISSION OF  
STEAM POWER.

**HOBBS & HARRINGTON,**

Manufacturers of  
MACHINISTS' TOOLS  
AND  
Special  
Machinery.  
UPRIGHT DRILLS A  
SPECIALTY.

426 N. 23d Street  
(Cor. of Linn),  
Philadelphia.

**GEO. M. EDDY & CO.,**

Manufacturers of  
**Measuring Tapes**  
Of Cotton, Linen & Steel.  
ALL PURPOSES.  
351 to 353 Casson Ave. Brooklyn, N. Y.

**PATENT HUB FRICTION CLUTCH PULLEY**  
AND  
**CUT-OFF COUPLING**



Manufactured by  
**JAS. SMITH & CO., 137 Market St., Phila., Pa.**  
We claim for this device the following advantages:  
It works easily, without noise, but effectively.  
It is very durable, extremely simple and cheap.  
It can be applied to pulleys with hub one inch in diameter.  
Up to sizes capable of transmitting 500 horse power or more.  
It can be placed on shafting in place of couplings for detaching lines.  
It has been adopted by several of the leading manufacturers of machinery. Unlike other clutches, the friction in this is applied to the hub upon which we hold exclusive control under patents No. 157,064, dated Nov. 24th, 1871; No. 208,808, dated Dec. 2nd, 1876. Clutches which are being placed on the market with any device or mechanism claiming a hub are infringements on the patent No. 208,808, and will in due time be prosecuted to the full extent of the law.



**TUBAL SMELTING WORKS,**

7, 9 South Broad Street, PHILADELPHIA.

**PAUL S. REEVES,**

MANUFACTURER OF

**ANTI-FRICTION METALS.**CAR & MACHINERY BRASSES, INQOT BRASS  
AND SOLDER, WHITE BRASS.

Old Metals and Brass Turnings Wanted.

ESTABLISHED 1842.

**WM. & HARVEY ROWLAND,**  
PHILADELPHIA,P. O. Address:  
Frankford, Pa.

MANUFACTURERS OF ALL KINDS OF

**Elliptic, Platform AND C Springs,**"Brewster Side-Bar Combination Patented" Springs and  
Timken's Patent Cross Springs,

Self's Patent, Groot's Patent, Carter's Patent and Saladee's Patent Crescent Spring,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.  
CAST SHOVEL, HOE AND MACHINERY STEEL.

KFORO TOE, SLEIGH, TIRE AND SPRING STEEL.

BESSEMER SHOVEL AND PLOW STEEL.

BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.

NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

**STEEL  
CASTINGS**FROM 1-4 TO 15,000 LBS. WEIGHT,  
True pattern, sound and solid, of unequalled strength, toughness and  
durability. An invaluable substitute for forgings, or for cast iron  
requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Ham-  
merheads, Crossheads for locomotives, etc. 2,000 Crank Shafts and  
1,000 Gear wheels of this steel now running prove its superiority  
over other Steel Castings, CRANK SHAFTS, CROSSHEADS AND  
GEARINGS ARE SPECIALTIES. Castings of every description.  
Circulars and Price Lists free. Address**CHESTER STEEL CASTINGS CO.,**

Works, Chester, Pa. 407 Library St., Philadelphia.

**PITTSBURGH STEEL CASTING CO.,**  
26th and Railroad Streets, PITTSBURGH, PA.

MANUFACTURERS OF

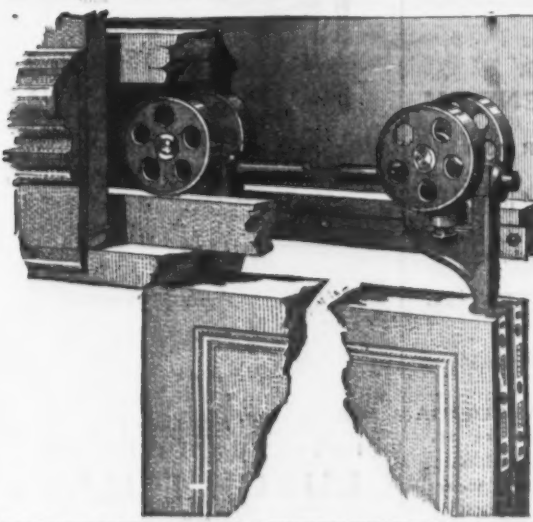
Refined Bessemer Steel; Improved Steel Castings  
Under Hainsworth's Patents.We are now prepared to fill orders for refined **BESSEMER BILLETS or BLOOMS**  
any desired carbon and a uniform quality.We would call attention of consumers to the fact that we use good material, and produce a steel  
pronounced by competent judges equal to the best English or German spring and soft steels.Having had twelve years' experience in the making of **STEEL CASTINGS**,  
we are able to refer to our customers in all parts of the United States and Canada as to the quality of  
our work in this line. We make castings of steel practically free from blow-holes, as soft and easily  
worked as wrought iron, yet stiff, strong and durable, with a tensile strength of not less than 65,000  
pounds to the square inch. In short, our castings unite the qualities of steel and wrought iron.Wheels, Pinions, Cranks, Dies, Hammer Heads, Engines and Machinery Castings of all  
descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landsides.  
Special attention given to Heavy Castings. We use no cast iron in our castings. Send for circular.**Punching Presses.****DIES AND OTHER TOOLS**

For the manufacture of all kinds of

**SHEET METAL GOODS,****DROP FORGINGS, &c.**

Stiles &amp; Parker Press Co.,

Middletown, Conn.

**NO FLANGED WHEELS.****Warner's Patent****SLIDING****DOOR HANGER,**

MANUFACTURED BY

**E. C. STEARNS & CO.,****SYRACUSE, N. Y.**

SALES OF

**CHAS. HUMES & CO.,****ST. LOUIS, MO.**

1877. - - - 20 SETS.

1881. - - - 500 SETS.

Send for Illustrated Catalogue.

**THE GILBERT & BENNETT MFG. CO.**

Georgetown, Conn.,

Manufacturers of

**Iron Wire, Sieves and****Wire Cloth,**

Power Loom Painted Screen Wire Cloth,

GILBERT'S RIVAL ASH SIEVE

Galvanized Twist Wire Netting.

WAREHOUSE

42 Cliff Street, New York.

**CHARCOAL BLOOMS**

For Sale By

**U. S. IRON & TIN PLATE COMPANY, Limited,**

Demmler P. O., Allegheny Co., Pa.

**STANLEY G. FLAGG & CO.**

PHILADELPHIA, PA.

Office and Works,

N. W. cor. 19th St. &amp; Pennsylvania Ave.

Manufacturers of

**STEEL CASTINGS.**A Substitute for Steel & Wrought Forgings.  
Circulars sent on application.**Steel Castings.**Light and heavy Steel Castings of superior  
metal, solid and homogeneous. All work guaran-  
teed. Send for circular.**EUREKA CAST STEEL CO.,**

Chester, Pa.

Office: 307 Walnut St., Phila.

**DIETZ NO. 0 TUBULAR****REFLECTOR LANTERN**

Can be used on the dash.

Throws a Powerful Light more than 100 feet.

Dietz Tubular Hot-Blast

**OIL STOVES FOR 1882.****R. E. DIETZ,**

54 &amp; 56 Fulton St., NEW YORK.

25 Lake St., CHICAGO.

**TACKLE BLOCKS.**

Rope and Iron Strap of all kinds. Lig-

numvite Wood for Ten-Pin Balls.

**Wm. H. McMillan & Bro.,**

Office, 113 South Street, New York

Factory, 39 to 40 Penn St., Brooklyn, E. D.

**COLUMBIA BICYCLE.**The Bicycle, as a permanent,  
practical road vehicle, is an  
acknowledged fact, and the  
thousands in daily use are  
constantly increasing in num-  
bers. It combines speed and  
endurance that no horse can  
equal, and for pleasure or  
health is far superior to any  
other out-door sport. The art  
of riding is easily acquired,  
and the exercise is recom-  
mended by the medical pro-  
fession as a means of renew-  
ing health and strength, as it  
brings into action almost  
every muscle of the body.  
Send a stamp for 24 page il-  
lustrated catalogue, contain-  
ing price lists and full infor-  
mation.**THE POPE MFG. CO.,**

597 Washington St., Boston, Mass.

New York Riding School, 34th  
Street, near 3rd Avenue.

THE BEST IN USE.

This is the only scientifically constructed bucket  
in the market. It is struck out from charcoal  
stamping iron. "No corners to catch." "No  
seams to burst." "No interior corners to clog  
up." It runs with great ease and half the power  
of the old style bucket. Will outwear half a  
dozen of them. Prices Reduced.**T. F. ROWLAND, Sole Mfr.,**  
BROOKLYN, N. Y.**BUFFALO SCALE CO.,**  
BUFFALO, N. Y.Manufacturers of  
**R. B. Track Scales, Hay Scales, Coal****Scales, Grain Scales, Platform****Scales, Counter Scales, &c.**

Send for price list, stating what you want

**ROLLER BUSHINGS I**

STEEL AND COMPOSITION.

**ROLLER BUSHED SHEAVES,**

IRON AND COMPOSITION.

**LIVESEY MANFG CO.,**

Factory, NEW LONDON, CONN.

FRANK BALDWIN, Agent, No. 33 South St., New York.

**AIR COMPRESSORS.**

PRICES REDUCED. SEND FOR NEW CATALOGUE.

**CLAYTON STEAM PUMP WORKS,**

15 AND 16 WATER STREET, BROOKLYN, N. Y.

**Scranton Brass Works,**  
**J. M. EVERHART,**

Manufacturer of

**BRASS WORK,**

For Water, Gas &amp; Steam. Also

Carr &amp; Wilcox's Patent Cut Files.

Will cut faster, wear longer, and clog  
less than any File in the market.

CHURCH STREET. - - - SCRANTON, PA.

**BLACKSMITH DRILLS.**

THE BEST DRILLS AND BEST DISCOUNTS.

**CLARK, SINTZ & CO.,**  
SPRINGFIELD, OHIO.**RUSSELL, BURDSALL & WARD.**

PORTCHESTER, N. Y.,

MANUFACTURERS OF

**CARRIAGE, TIRE, PLOW, STOVE & OTHER BOLTS.**

Carriage Bolts made from Best Square Iron a Specialty.

**JOHN RUSSELL CUTLERY CO.,**

Green River Works,

MANUFACTURERS OF

**Table and Pocket Cutlery,**

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' &amp; HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

OLDEST AND LARGEST AMERICAN MANUFACTURERS.

Factories,



Turners Falls, Mass.

**F. W. WURSTER,**  
**IRON FOUNDRY**  
**AND AXLE WORKS,**  
130 to 142 First St.,  
Brooklyn, N. Y.**AXLES****WAGON, CART AND**  
**CARRIAGE AXLES.**Our facilities enable us to quote the  
trade lower prices than any other  
manufactory. Send for price list.**J. M. CARPENTER****PAWTUCKET, R. I.**

MANUFACTURER OF TAPS AND DIES.

**"BOYNTON'S" UNRIVALED SOLID  
STEEL SAW SET.****E. M. BOYNTON SAW & FILE CO.**

24, 26, 28, 30 &amp; 32 DEVON ST.

BROOKLYN.

**E. M. BOYNTON,**

80 Beekman Street, NEW YORK.

**EMPIRE SPRING HINGES,**

For Screen Doors.

Easily Adjusted.

No Pieces to Lose.

Extra Strong Springs

and Flanges.

MANUFACTURED BY

**VAN WAGONER & WILLIAMS,**

82 Beekman St., NEW YORK.

We have just issued a new Price List of our goods, which  
will be mailed on application.**WM. GILMOR of WM., BALTIMORE, MD.,**Rivets,  
Spikes,  
Bolts,  
Nuts,Washers,  
Bolt Ends,  
Wood Screws,  
Track Bolts,**BOILER AND BRIDGE RIVETS.**

Carry stock with New York Agents, LOVEJOY &amp; DRAKE, 49 Cortlandt Street.